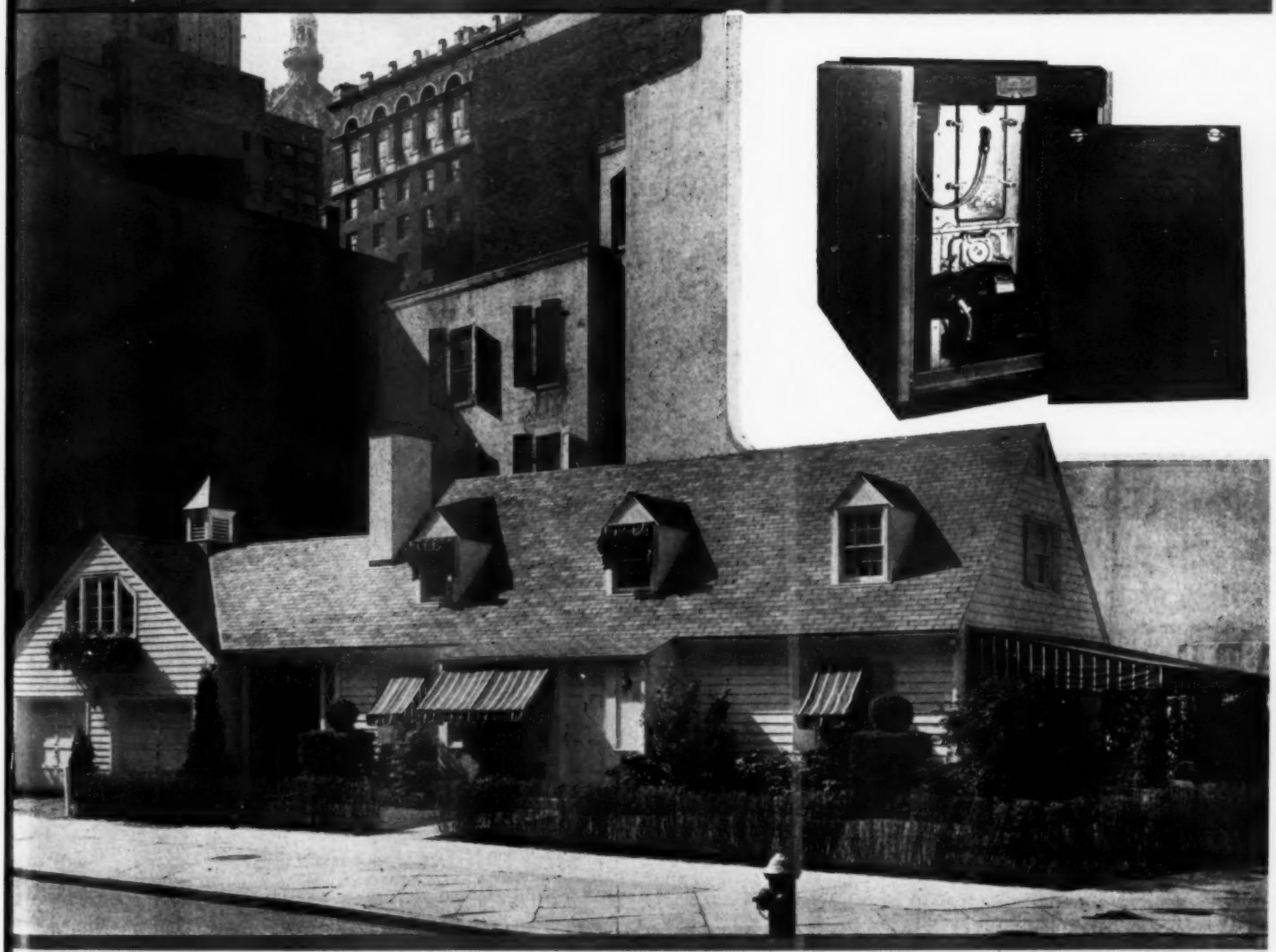
AMERICAN

ARTISAN

OCTOBER 1948
68th Year

RESIDENTIAL AIR CONDITIONING • WARM AIR HEATING • SHEET METAL CONTRACTING



IN THIS ISSUE

- One of the most important details of running a successful business is control of overhead.—Page 72.
- A steel executive analyzes "The Outlook for Steel" and decides expansion is essential on Page 83.
- One of our author-contractors has put on a copper roof good for 100 years, he claims. See Page 97.
- What's New? Read Equipment Developments and New Literature and find out. Pages 113 & 120.

• Our cover photo this month shows "Mr. Blanding's Dream Home" nestling among the New York skyscrapers. The winter air conditioning unit shown was selected to heat the house.

Simplenic*

*© T. M.

is the Trade's *BIG SELLER!*

The new Lamneck Simplenic System has been on the market for just six months now . . . and already heating contractors have given it such a "big" reception that it is far out front in volume sales for simplified installations everywhere! This is a remarkable tribute to Simplenic's sound design and production excellence . . . as well as to the sound business sense and quick response of the trade in ***recognizing*** a "good thing" when it appears!

.... another Lamneck "first" in Heating System Sales and Value!

Simplified — Only four duct fittings are required for serving every take-off application — and *no* increasers or reducers are needed! Fewer pieces to handle, fewer to assemble, no odd item stock problem!

Low Cost — Our production-line volume and material-saving design and your simplified job-figuring, material stocking, and installation ease, let you *buy* and *sell* the Simplenic System at best competitive prices!

Efficient — Lamneck precision fabrication of all parts gives fast, accurate fitting — improved type, self-locking joint connections speed assembly operations — simple for even new men to install properly.

Complete — No more hodge-podge and delays in piecing out the required materials and fittings to complete a job, with a complete precision-matched Simplenic bill-of-materials!

Write Today for *Simplenic*

descriptive price list and name of your nearest jobber.

CLAYTON & LAMBERT MFG. CO.

1760 DIXIE HIGHWAY • LOUISVILLE 10, KY.

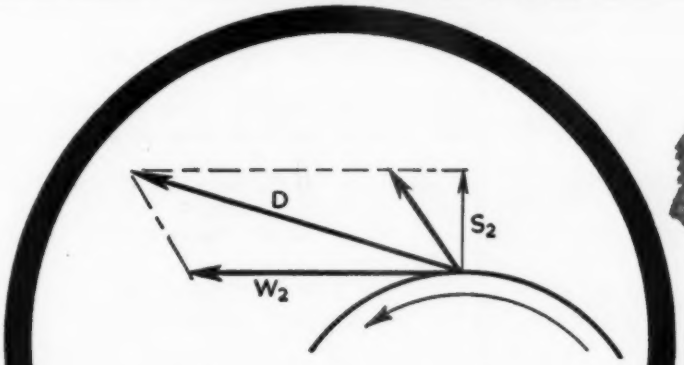
ANOTHER GREAT C&L PRODUCT

Lamneck TRADE MARK

FURNACE PIPE AND FITTINGS

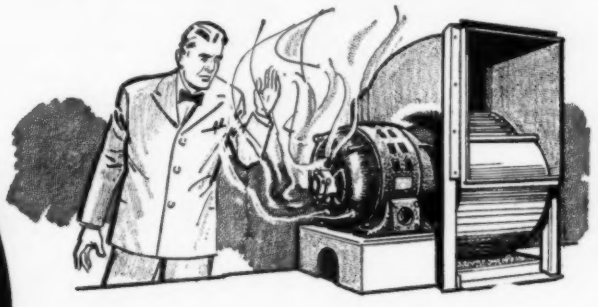
Blower-ology

A QUIZ TO KEEP YOU UP TO DATE



1 ***YOU'LL RECOGNIZE THIS*** *AS THE VECTOR DIAGRAM OF A BLOWER. BUT WHICH TYPE OF IMPELLER . . .*

- ☐ *FORWARDLY CURVED BLADE?*
- ☐ *BACKWARDLY INCLINED BLADE?*



2 ***CHAIN STORE OPERATOR*** *MOVES A BLOWER FROM DENVER STORE TO AN IDENTICAL BUILDING IN NEW YORK . . . FINDS THAT MOTOR OVERHEATS. WHY?*

3 ***ONE OUNCE WEIGHT,*** *SKILLFULLY APPLIED BY USAIRCO TECHNICIAN, CAN MOVE MILLIONS OF EXTRA POUNDS OF AIR PER YEAR. WHO'S THE MAN?*

4 ***YOU MEET A SUGAR TYCOON*** *FROM CUBA, AND HAVE A CHANCE TO BID ON A SERIES OF BLOWER INSTALLATIONS. HOW CAN YOU GET TECHNICAL HELP IN A HURRY?*

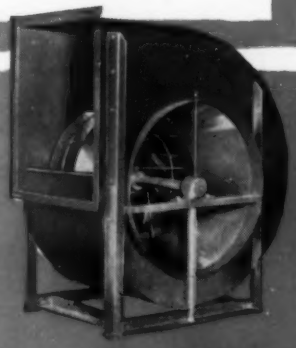
ANSWERS:

1 It's a forwardly curved blade diagram. But don't feel chagrined if you missed; it's a tricky question. All USAIRCO designing engineers are drilled in such problems, to help make USAIRCO blade design *the best.*

2 Because air at sea-level is far heavier than air at high elevations. USAIRCO takes all such factors into account, in designing and in working with the installer. You can be certain that all possible "ifs" have been eliminated, in USAIRCO recommendations.

3 He is one of the highly trained USAIRCO specialists who balance blower wheels. Perfectly balanced blowers insure continuous and trouble-free operation with no loss due to costly shut downs and repairs. In such jobs, where the "human factor" is all-important, USAIRCO's long experience makes a lot of difference!

4 It's easy. Just write, wire or 'phone USAIRCO for authoritative information. World-wide experience and top-notch engineering talent are yours to use freely, through USAIRCO's consulting service.



THERE'S A TYPE AND SIZE OF USAIRCO BLOWER FOR EVERY NEED.

UNITED STATES AIR CONDITIONING CORPORATION
3360 Como Ave. S.E. Minneapolis, Minn.

USAIRCO

AMERICAN ARTISAN

RESIDENTIAL AIR CONDITIONING • WARM AIR HEATING • SHEET METAL CONTRACTING

Member—Audit Bureau of Circulations
Member—Associated Business Papers

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ASSISTANT EDITOR
A. A. Kennedy

ADVERTISING STAFF

Wallace J. Osborn
New York City
MUrray Hill 9-8293

Robert A. Jack
Cleveland
YEllowstone 1540

James D. Thomas
George C. Cutler
Chicago
STate 2-6916

R. Payne Wettstein
Los Angeles—TUcker 2779
San Francisco—YUkon 6-2522
Seattle—ALder 6365
Portland—GArfield 1903

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Founded 1880

OCTOBER, 1948

Volume 117, No. 10

Syncromatic

SCORES A FIRST!

IN FURNACE HISTORY

A NEW *Super-Styled* UNIT

FOR COAL OR OIL FIRED

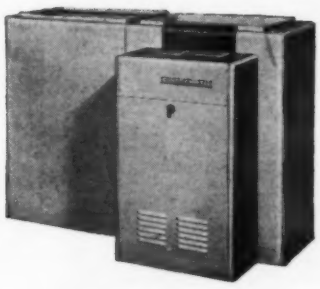
AN EFFICIENT COAL - FIRED UNIT THAT CAN BE CONVERTED TO AN EFFICIENT OIL-FIRED UNIT

Syncromatic **COUNTER FLOW**

GRAVITY OR FORCED AIR

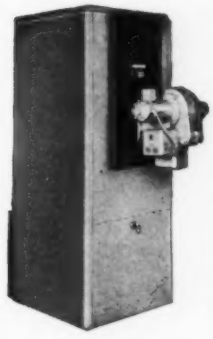
ONLY *Syncromatic* HAS THE GROUND FIT DOORS COMBINED WITH VENTILATED STEEL CABINET SHIELD WHICH NOT ONLY INSULATES AND COOLS DOORS BUT INCREASES EFFICIENCY AS WELL

HI-BOY GAS UNITS
2-Sizes
[illegible],000 and 100,000 B.T.U.
[illegible]ear or bottom return



OFB OIL-FIRED SERIES
5-Sizes
90,000 to 250,000 B.T.U.

GFB GAS-FIRED
Basement Models
4-Sizes
120,000 to 240,000 B.T.U.



OFB-621
HI-BOY OIL-FIRED
Gun-Type Burner
85,000 B.T.U.

Syncromatic Corporation
WATERTOWN, WISCONSIN

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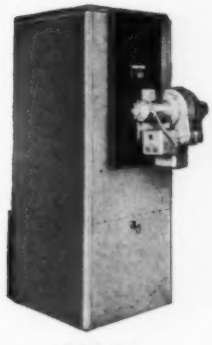

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WATERTOWN, WISCONSIN

the editor's notebook

Thanks to You

My copy of the September issue of AMERICAN ARTISAN arrived this morning and I wish to be among the first to congratulate you on your lead editorial and its tie-in with our sheet steel survey.

Particularly impressive are the pictures on pages 97 to 112 inclusive showing the essential uses of sheet metal in industry.

Please accept my thanks on behalf of the industry for your able presentation. We are hopeful that our combined efforts will aid in relieving this critical situation.

RICHARD E. WALSH
President
Sheet Metal Contractors' National Association, Inc.
St. Paul, Minn.

. . . and You

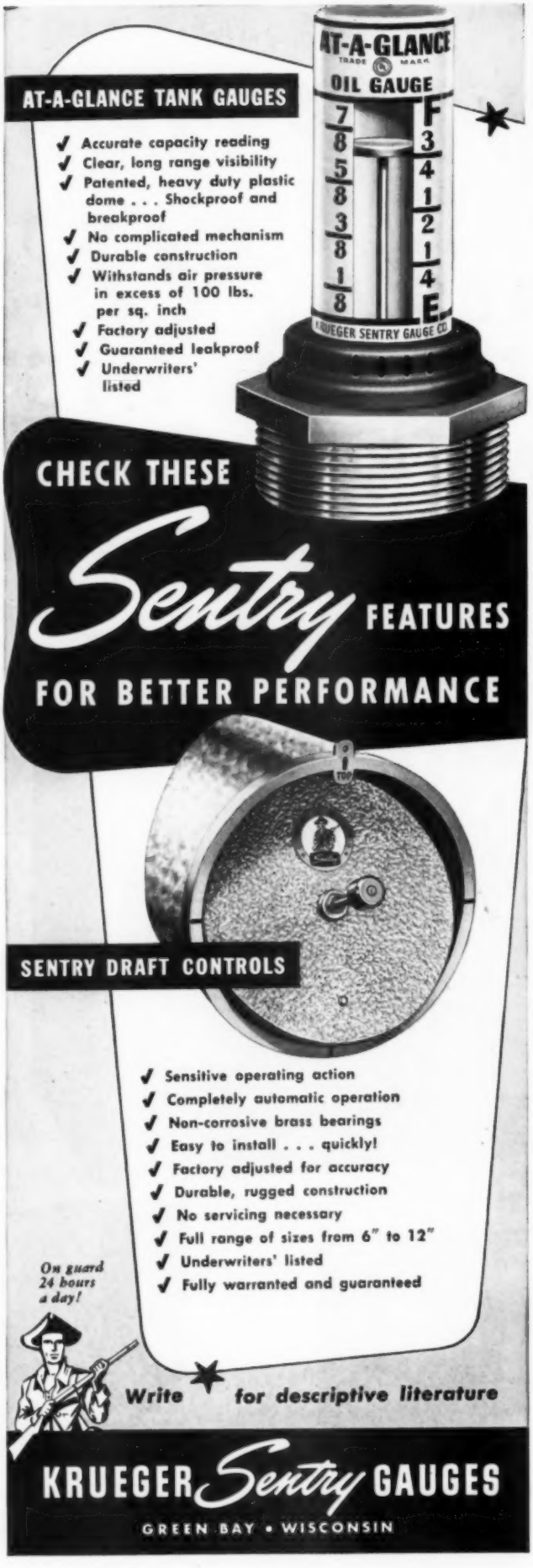
We received our copy of the September issue this morning and wish to thank you for the splendid article showing our sheet metal work in the Russell Miller Milling Company mill. We are very much pleased with the display of pictures you published and wish to say that the presentation fully exemplifies the scope and the essential character of the installation.

Will you please send a copy of this issue to the officials of the Russell Miller Milling Company listed?

J. H. WALTERS
J. H. Walters & Co.
Alton, Ill.

Home Ownership

Federal Reserve statistics show that approximately 2,200,000 homes were purchased by American families in 1947 —700,000 new homes and 1,500,000 used homes. Of the total, 39 per cent were purchased by families with incomes under $3000, and 18 per cent by families with incomes over $5000.


AT-A-GLANCE TANK GAUGES
✓ Accurate capacity reading
✓ Clear, long range visibility
✓ Patented, heavy duty plastic dome . . . Shockproof and breakproof
✓ No complicated mechanism
✓ Durable construction
✓ Withstands air pressure in excess of 100 lbs. per sq. inch
✓ Factory adjusted
✓ Guaranteed leakproof
✓ Underwriters' listed
AT-A-GLANCE
OIL GAUGE
KRUEGER SENTRY GAUGE CO.
CHECK THESE
Sentry FEATURES
FOR BETTER PERFORMANCE
SENTRY DRAFT CONTROLS
✓ Sensitive operating action
✓ Completely automatic operation
✓ Non-corrosive brass bearings
✓ Easy to install . . . quickly!
✓ Factory adjusted for accuracy
✓ Durable, rugged construction
✓ No servicing necessary
✓ Full range of sizes from 6" to 12"
✓ Underwriters' listed
✓ Fully warranted and guaranteed
On guard 24 hours a day!
Write for descriptive literature
KRUEGER Sentry GAUGES
GREEN BAY • WISCONSIN

the editor's notebook

Why Inflation?

Now that our present high prices are acknowledged as evidence of inflation everyone has good reasons why we have this condition. Of course the other fellow is always the culprit. But here are some reasons for high prices that seem to strike a middle ground by paying recognition to most factors which affect our economy:

1. Government's spending more than it took in.
2. Rationing and price control in war years—without adequate wage control.
3. Necessary shooting away of about half of the country's production in the war years.
4. High cost of government in peacetime—taking almost 20 per cent of the country's production and income for its own purposes.
5. Paying subsidies to put and keep prices up—even in a seller's market.
6. Round after round of postwar general wage increases to most everybody—thus diluting further the value of money because there was no corresponding individual contribution to increased production.
7. Too anxious consumer demand for available production.
8. Spending of savings and too much unnecessary buying on credit.
9. Needed aid for Europe, and the new re-armament program.
10. Lowered taxes for individuals—which freed extra money for further upward pressure on prices.

you'll be proud, too!

MEYER D SERIES OIL-FIRED HI-BOY FOR SMALL HOMES

Here's the newest member of the famous WEIR-MEYER family — and one you'll be proud to show. This compact, efficient unit is especially designed and built to provide fully automatic Indoor Comfort for your mass market, the small home. Output at bonnet: 72,500 BTU/hr. Completely accessible. Easy to sell, install, and service.

Meyer D series is ideal for utility rooms or small basements. Takes no more room than a small closet. Fully automatic . . . quiet and economical. Write for literature.

THE MEYER FURNACE COMPANY - GENERAL OFFICES NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION INDOOR COMFORT PEORIA 2, ILLINOIS

Gas-fired Hi-boy | Gas-fired Air Conditioner | Gas-fired Gravity | Oil-fired Hi-boy | Oil-fired Air Conditioner | Weir Steel Furnace | Coal-fired Air Conditioner | Industrial & Commercial Heating Equipment

MANUFACTURERS OF WEIR & MEYER FURNACES - AIR CONDITIONERS FOR GAS - OIL - COAL - FACTORIES: PEORIA AND PERU, ILLINOIS

the editor's notebook

Boom-Bust

Can you do something to sustain prosperity? Can you assist in the prevention of depression? Can you contribute to the solution of the boom-bust problem?

These questions are answered in the affirmative and the answers comprehensively explained in a guide for business conduct now being distributed by the Chamber of Commerce of the United States. Entitled *Action Against Depression* (20 cents), the booklet is designed as something to be consulted, checked, and rechecked at frequent intervals.

It outlines situational developments which influence business fluctuations and stimulates action by suggesting "Dos" and "Don'ts."

Here's an example of a "Do": Study past and current inventory-sales ratios in your company and your industry. How about their bearing on your inventory policy for the future?

And a "Don't": Don't treat your own business as if it were in a vacuum. Don't make your plans on an "all other things being equal" basis. Other things will not be equal. Don't forget that other businessmen and customers will be making decisions which will change your own situation.

Sales Punch

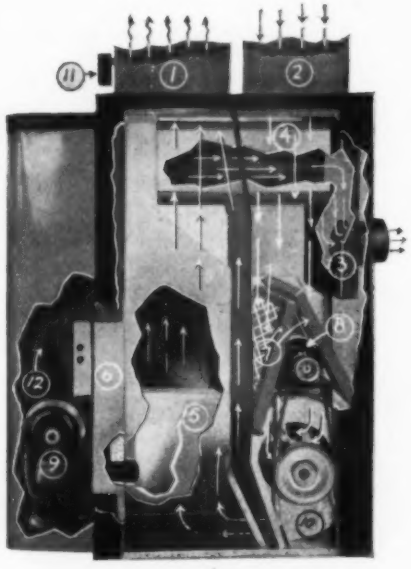
Can we get about six reprints of *A Sales Manual With Punch*, parts 1 and 2? If so, please have them mailed to us with a statement for the charges.

GEORGE W. TURNER
George B. Mallory Company
Fresno, Calif.

Sun FUEL MASTER OIL BURNING FURNACES

Quality and Beauty

AT LOW COST!



5 Sizes Counter-Flo Basement Type
66,000 to 200,000 Btu.

2 Sizes Utility Type Hi-Boys
85,000 and 100,000 Btu.

One Gravity Furnace—76,500 Btu.

A SIZE and TYPE for EACH HOME

NATION-WIDE DISTRIBUTION

Write—

J. V. PATTEN COMPANY

Sycamore, Illinois

the editor's notebook

The Business Press

"The need for help from the business press in selling ideas is even greater today than it was during the war," says Charles E. Wilson, president of General Electric Company.

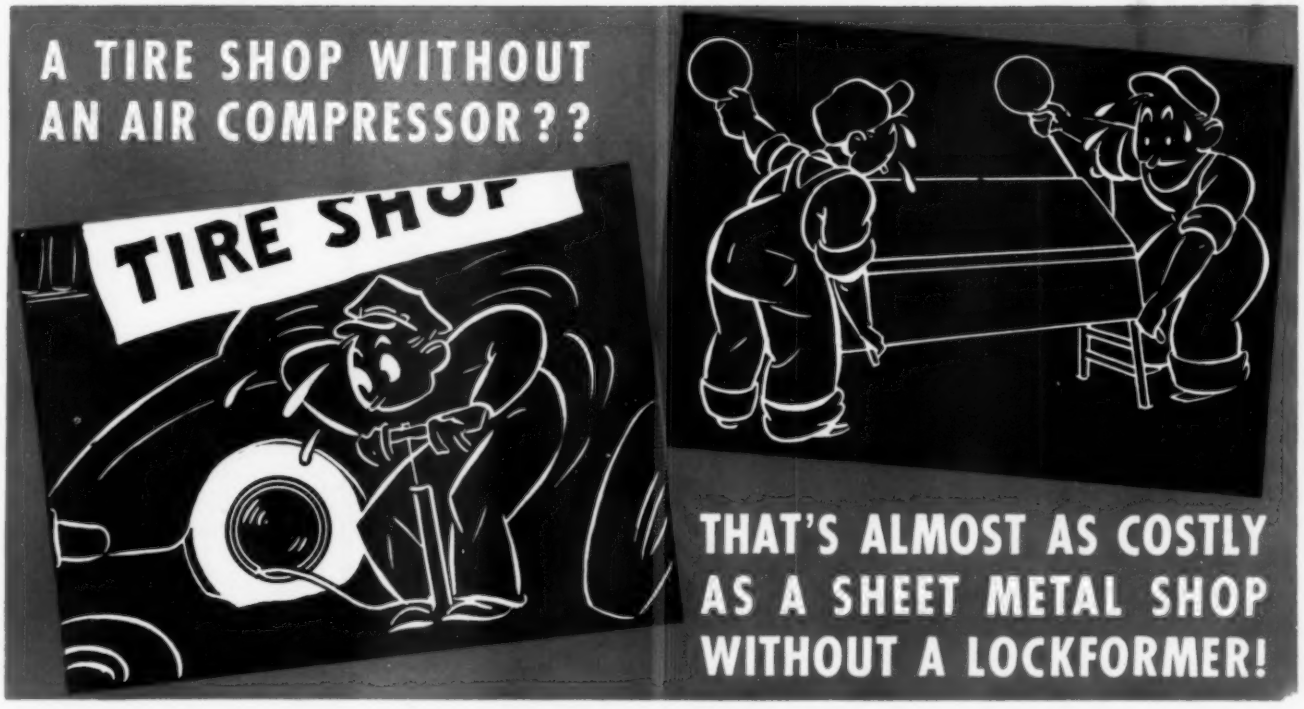
"This American way of ours must be sold through the combined efforts of industry, advertising and media, and the business press can be of inestimable help in influencing individuals to get behind this job.

"There were many instances during the war where the business press did jobs that no one else could accomplish and we will be ever grateful for that contribution. Today, however, the need for unity is greater than ever and your efforts will greatly aid in bringing this unity to the people when they need it most.

"Whether it is peace or war, it seems to me that the business press of this country performs an invaluable function. Maybe I am prejudiced, but I believe the business community is a pretty important segment of public opinion. Any advertising space you contribute . . . or any editorial you run to help public service campaigns will be of very great value indeed.

"The business press, I believe, has a special mission in selling the American economic system. I don't know of any other agency that can do this job . . .

"People take very seriously what they read in the business press and your part in selling the American system will help spur industry on to do its part in making our country a better country and better place in which to live."

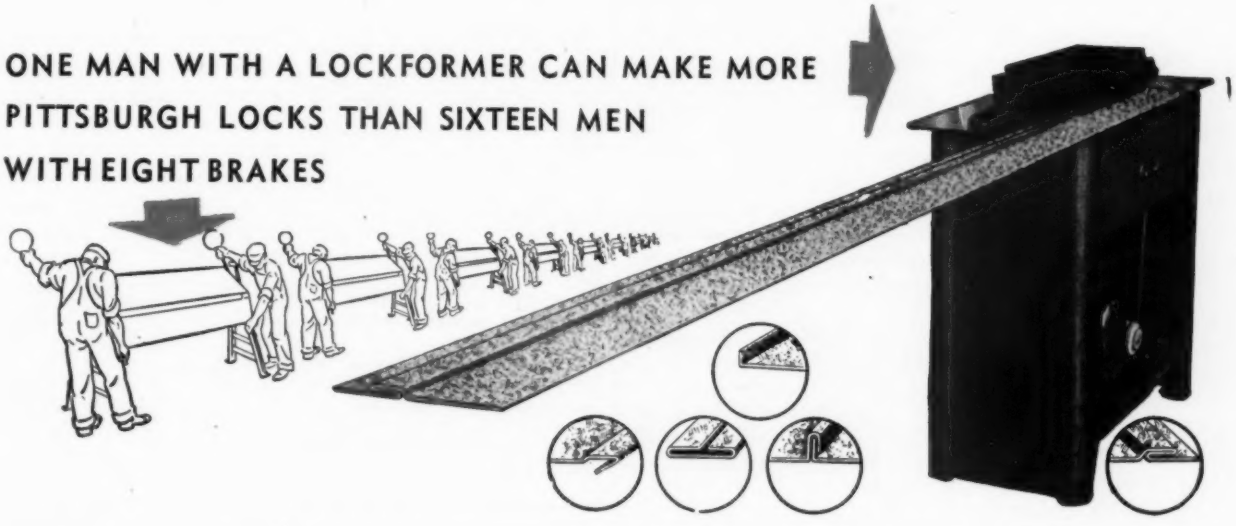


A LOCKFORMER *cuts Sheet Metal Fabrication Costs* IN HALF!

A Lockformer makes a Pittsburgh Lock on an 8 foot sheet in less than 20 seconds — about fifteen times as fast as press brake methods. Double Seams, Drive Cleats, Standing Seams and Right Angles are made with similar speed.

This tremendous savings in forming time reduces *over-all* fabrication costs by 50% — cuts your shop costs in half! Like pumping tires by hand, "getting along without a Lockformer" is a costly proposition. Write for catalog and prices NOW!

ONE MAN WITH A LOCKFORMER CAN MAKE MORE
PITTSBURGH LOCKS THAN SIXTEEN MEN
WITH EIGHT BRAKES



THE LOCKFORMER CO.

4615 W. ROOSEVELT ROAD • CHICAGO 50, ILLINOIS

the editor's notebook

Civic Activity

Businessmen who desire to take an important part in civic activities will find opportunities to lead the way in solving the complex problems facing many of the nation's cities and villages.

What they can do to meet such difficulties as dense traffic, parking, truck transportation, zoning, and development of fringe areas and blighted districts was recently outlined at a Businessmen's Conference on Urban Problems.

Out of the discussions came a recommendation that municipalities spend more money for realistic planning and an appeal to businessmen to interest themselves in the idea and to volunteer their assistance.

Transcriptions of the proceedings will soon be available. They will be valuable for reference to contractors who wish to participate in civic affairs and so expand their public relations programs.

Housing Complaints

The editorial in the July issue referred to the allegations by advocates of public housing that private construction had failed to provide adequate and satisfactory housing. It also mentioned the acknowledged failure of public housers to protect the public in its relations with the construction industry, but for this failure they point to the lack of personnel required to police the industry and this, of course, includes inspection of material and equipment installed by heating and sheet metal contractors.

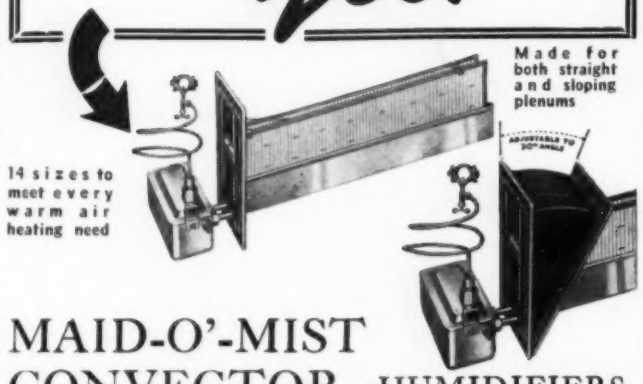
Continuing, the editorial

SUPERIOR PERFORMANCE?

Yes!

LOW PRICE?

Yes!



MAID-O'-MIST CONVECTOR HUMIDIFIERS

. . . Easier to Sell More of Them

★ This is not just another "ad." It's an opportunity for YOU to handle *the best-engineered, the finest-built* line of automatic humidifiers offered today.

★ Maid-O'-Mist Convectors have patented features which enable them to "run circles" around older type equipment . . . and yet, due to simplicity of design and modern mass production, *our prices are amazingly attractive.*

★ You have only to check with your jobber—or write us for complete information—*to know the truth of these statements.* Definitely will it pay you to FIND OUT.

LOOK!

(A) FLASH ACTION—copper trough transmits heat to water NINE times faster, and—

(B) 30% MORE evaporating area—you can guarantee *adequate humidity* on every type of installation.

(C) 60% LESS air restriction—very small units; practically no throttling of heat flow through plenum.

(D) 50% LESS time to install—cut small opening in plenum, snap in unit (self-locking front plate), make water connections—*that's all!*

MAID-O'-MIST INC.

3213 N. PULASKI RD.
CHICAGO 41, ILLINOIS

AUTOMATIC HUMIDIFIERS FOR ALL TYPES OF HEATING SYSTEMS

the editor's notebook

observed that testimony in Congressional hearings neglected to mention the responsibilities of supervising architects or inspections by loaning companies as a means of obtaining satisfactory and acceptable performance in the past. The editorial failed to mention the inherent safeguards of our competitive business system as an additional assurance of satisfactory housing.

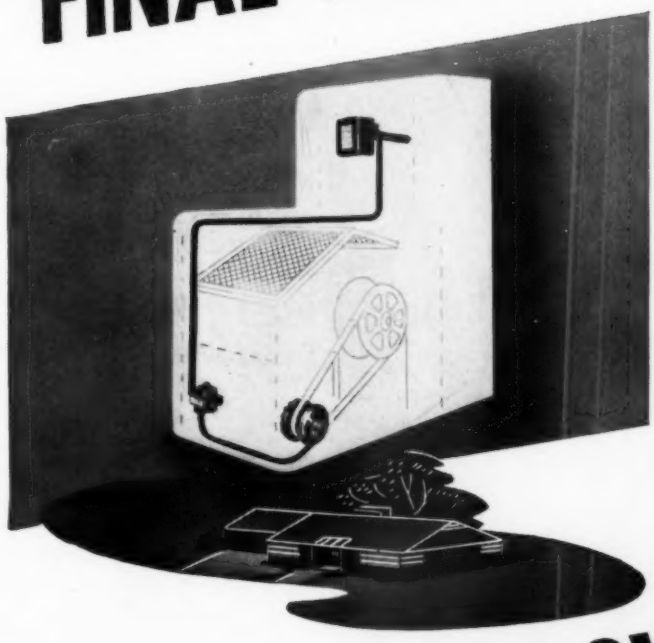
That this subject of policing construction is by no means dormant is evidenced by the following letter addressed to Frank W. Cortright, executive secretary of the National Association of Home Builders, and signed by Housing Expediter Tighe E. Woods. The background for the letter is obvious from the text.

"It was indeed a pleasure to receive your letter of August 23 and to learn that you share my deep concern in obtaining justice for those veterans who have been cheated by irresponsible builders in the purchase of their homes.

"You state that you again proffer your services in running down veterans' housing complaints. Let me assure you that I hasten to again accept your offer.

"You understand, of course, that we cannot delegate to your association either the responsibility or the authority to investigate or act upon complaints of Federal violations, as such activity must naturally be performed by government employees. However, as I pointed out to you when you last visited my office, I do feel that you can be of great assistance in this veterans' program in a number of other ways.

The FINAL TOUCH---*for Perfect Warm Air Heating*



MORE SALES MORE SATISFIED CUSTOMERS

At a cost within the reach of the average home owner you can now offer a control that will end drafts—hot and cold "layers" of air—"cold 70". On new installations or jobs already installed, it makes a more satisfied user of forced air heating.

Cool air being gently expelled from ducts.

Now the warmer air starts coming.

The rooms need heat/ Blower at full speed.

Thermostat satisfied —blower starts slowing down.

Everything comfortable—just a warm zephyr to keep it that way.

MASTER BLOWERTROL

It starts the motor at a plenum temperature of 100° and gradually increases the speed of the blower as the plenum temperature rises until it reaches 125°. The blower operates at full speed until the plenum temperature drops below 125° at which point it gradually decreases speed as the plenum temperature drops.

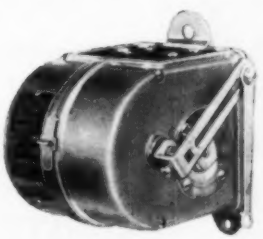
NOT JUST A ~~RUSH~~ OF HEAT—

It's —comfort— Flowing In

SPRING RETURN HEAT REGULATORS

This thermostat is designed for two-wire operation and is regularly furnished in an ivory colored plastic case. It has a sensitive bimetal blade, magnetic snap-action and shield to protect the contacts from dust.

Type A 12
Thermostat



Type B 12
Spring Return Motor

This is a deluxe model of a damper motor with many new features. It operates to two positions. When the thermostat is satisfied or the electrical power fails the motor is immediately returned to the CLOSED or OFF position by a heavy internal spring built right into the motor.

THE WHITE MANUFACTURING CO.

2368 University Ave. **Saint Paul, Minnesota**

the editor's notebook

"We receive frequent complaints from veterans concerning shoddy construction, in which there is evidence of the veterans having been badly cheated by builders where the construction complained of does not come under Federal regulations. The local home building associations, which you mention having in 115 large cities, could be of the greatest benefit to this program if they would set themselves up to receive these complaints and bring such influence as they may have to bear on the corrections or adjustments of the construction complaint.

"You appear to misunderstand our program when you refer to difficulties of builders because of what you call 'multitudes of regulations, rules, requirements, directives, incentives, and programs . . . poured out upon the building industry,' and state that unwitting violation of these regulations occurred easily. What we are concerned with are what you might call the simple violations, such as where a builder charges a higher price than the one approved, or where he failed to build according to his own specifications—and I think you will agree that any reputable builder should understand his own specifications.

"I am particularly pleased to note your statement that you want to see proven gouging of veterans punished and that you want to do everything possible to run such irresponsible builders out of business. I hope you will keep me advised of action taken by your association with respect to members who have been indicted for housing frauds against veterans.

No Rust-No Corrosion
No Painting
with Plastipitch* Protected Metal

SHEET Metal Contractors sing the praises of Plastipitch Protected Metal for industrial, railroad and farm buildings.

For roofing and siding, Koppers takes preformed commercial-quality steel sheets —corrugated, crimped and flat—and coats them on both sides with Plastipitch. This tough, corrosion-resistant Pitch Compound adheres tenaciously to metal no matter how high or low the atmospheric temperature may go. So you have all the advantages of steel—plus long-lasting protection against rust, corrosion, salt air, weather and corrosive industrial atmospheres.

Koppers Plastipitch Protected Metal is priced right; it's easy to sell . . . easy to erect. And it's easy to obtain, because warehouse stocks are available from Approved Distributors in major trading areas. Write to Koppers — or to the nearest District Office shown below—for our Engineering Manual on Plastipitch Protected Metal.

KOPPERS COMPANY, INC. · Pittsburgh 19, Pa.

KOPPERS

PLASTIPITCH
* Trade-Mark Reg. U. S. Pat. Off.
PROTECTED METAL

DISTRICT OFFICES: PITTSBURGH: Koppers Building—NEW YORK: Empire State Building—PROVIDENCE: 178 Massasoit Ave., E. Providence 14, R.I. —BOSTON: 250 Stuart Street—NEW HAVEN: 251 East Street—BIRMINGHAM: Woodward, Ala.—ST. LOUIS: 4000 Bingham Avenue—CHICAGO: Peoples Gas Building.

the editor's notebook

"If you will furnish me a list of the local home building associations in 115 large cities which are now set up for checking on complaints and bringing veterans and builders together, I will see that it is sent out to our field offices so that veterans may be referred there on complaints of housing frauds which we are unable to handle."

Speaking before the annual convention of the American Veterans of World War II in Chicago last month, Housing Expediter Tighe E. Woods explained to the veterans what his office is doing with veterans' housing complaints. He pointed out that until recently his agency had only 15 or 20 investigators for the entire country and it was impossible to make even a dent in the approximately 30,000 complaints received from veterans.

"But Congress last year gave us money to add 250 men to our staff and we are now recruiting and training the new investigators," Mr. Wood said. "I hope that beginning next month our enlarged staff of investigators can begin making real progress in digging into the backlog of complaints and coming up with settlements that will really amount to something.

"Our primary concern in this job is to get the veteran his money back, if he was overcharged; or in getting the defects or deficiencies in his house corrected, if the builder failed to comply with specifications. We try to achieve this through conferences with the builders, and, except in the most flagrant cases, only when such efforts fail do we turn the cases over to the District Attorneys for court action."

Mueller Climatrol Winter Air-conditioner illustrated is the oil-fired Series 50.

Mueller Climatrol fuel-thrifty Furnaces whittle down the cost of comfort . . . with heating economy that helps you sell

Economy is a "buy" word for heating equipment today. That means *you* have a strong competitive story on the fuel-thrifty Mueller Climatrol line — a story you can count on for extra sales and profits.

That's the story to tell, because that's the story that sells. And it's hard to beat when every customer is concerned with the high cost of fuel — and the limited supplies.

Tell your customers that all Mueller Climatrol heating equipment is *engineered* to get the most heat out of the fuel they burn — with the least waste. Explain that this economy is not delivered by a "bargain" furnace, nor by obsolete equipment they hope will "last a few more years."

Show them how every part of a Mueller Climatrol unit is designed for fuel-thrifty operation (with gas, oil, or coal — or convertible for either gas or oil). Point out the careful attention to construction details, the scientific heat-exchanger design, the special features of the burner and combustion units. Tell them that these features are their assurance of fuel-thrifty economy — the product of Mueller's 91 years of experience.

The more often you tell that story, the more profitable sales you will make. Write for information on the complete Mueller Climatrol line. . . . *L. J. Mueller Furnace Company, 2010 West Oklahoma Avenue, Milwaukee 7, Wisconsin.*

MUELLER Climatrol

REG U.S PAT OFF.

Egg-breaking production line where girls separate the whites from the yolks. Conditioned air here keeps dust and bacteria from contaminating the eggs.

BETTER EGGS THE YEAR AROUND with air-conditioning

Frozen eggs and powdered eggs rivalling the fresh-laid article in quality and flavor are now widely used by bakers, confectioners and manufacturers of various food products. As fresh in December as they are in May, these processed eggs are not subject to seasonal price changes like ordinary eggs in the shell.

This dramatic development in the food industry has been made by progressive produce firms who have taken full advantage of modern air-conditioning and refrigeration.

An example is the Seymour Packing Company of Topeka, Kansas. Starting out as a small produce and poultry store in 1890, this organization constantly improved its methods through research, and expanded until it became one of the nation's largest processers of eggs. During the Spring when eggs are at the peak of quality, Seymour breaks, homogenizes and freezes more than 2,000,000 per day.

Some of these are stored then sold later in the frozen form. Others are dehydrated by pumping liquid egg in a fine spray under high pressure into a heated cyclone-type drying chamber to be sold in powdered form. In these processes strict control of temperature, humidity, and air circulation are of vital importance. This control protects the flavor, guards against weight losses, and prevents spoilage of a highly-perishable food.

The refrigeration and air-conditioning equipment used in the Seymour plants is manufactured by the York Corporation who in turn uses high-quality Bethlehem steel sheets in many of its products. Bethlehem manufactures the full line of hot-rolled, cold-rolled, galvanized, and copper-bearing steel sheets used in the manufacture and installation of industrial air-conditioning systems.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

Export Distributor: Bethlehem Steel Export Corporation

More than 40 carloads of fresh eggs are stored here in the Seymour plant awaiting processing. Storage temperature of 31 deg with high humidity prevents these eggs from losing weight and from absorbing outside odors.

Cases of liquid eggs in a freezing tunnel. Here an air blast of 50,000 cu ft per min at 20 to 25 deg below zero freezes the eggs solid.

Over the back fence,

this new PETRO owner is giving YOU the world's best advertising!

"Best oil burner made!" How enthusiastic the homeowner gets when he discovers the fuel economy and fine heating performance of the Petro you've given him! How quickly he tells his friends and neighbors about it—praising you and the heating plant you've installed for him. It's through such priceless word-of-mouth advertising that every Petro you put in helps you "sell" another.

You can go after *any* oil heating installation with the complete Petro line—oil burners, boiler-burner units, furnace-burner units, water heaters. See the established Petro plumbing and heating jobber in your wholesale trading area.

PETROLEUM HEAT AND POWER COMPANY
Stamford, Connecticut

Makers of Good Oil Burning Equipment Since 1903

REFINERIES... FUEL OIL STORAGE AND DISTRIBUTION TERMINALS
NATIONWIDE OIL BURNER SALES AND SERVICE FACILITIES

WHAT ELSE DO YOU GAIN WITH PETRO?

OUTSTANDING SELLING FEATURES, such as patented "Tubular Atomization" assuring your customer more heat from less fuel.

VIGOROUS PROMOTION THROUGH NATIONAL ADVERTISING, reaching every oil burner prospect in your territory... building up a preference for Petro and helping pre-sell *you* as a leading heating contractor in your community.

PRODUCT DEPENDABILITY, reflecting over 45 years' oil heat "know-how" of the world's oldest, largest exclusive oil-heat equipment maker.

PETRO
REG U S PAT OFF
OIL BURNERS • BOILER-BURNER UNITS
FURNACE-BURNER UNITS • WATER HEATERS

Ask yourself these important questions about your heating business

- Do you have to stock many different models to meet your customer's requirements? Does this high inventory cut into your profit?
- Does the equipment you handle require complicated installation that cuts into your sales volume? Does it have to be wired and assembled? Does it need difficult duct work?
- Do you have to order "special" equipment for your installations? Do you have to "tailor" your line to fit customer's needs? Do your jobs lag because of made-to-order requirements?
- Do your customers trouble you with service calls? Is your equipment plagued with mechanical troubles? Nozzles clogged? Parts worn out?
- Is the line you handle really competitively priced to meet today's customer resistance? Does the model represent real sales value in its price bracket? Is it equipment that has genuinely low operating costs?
- Do you have a line designed to meet the needs of the small home owner . . . the market where real volume and profit lie? Are the models completely automatic? Are they engineered to produce plenty of heat at low cost?

Blower installed underneath burner

Blower installed in the rear

▲ **MODEL 388**

A forced air furnace that takes the place of 3 separate units

A compact, automatic unit for basement, closet or utility room. 82,500 B.T.U. output. A powerful 10" Sirocco blower circulates filtered warm air in winter . . . cool air in summer. Blower also may be installed at sides.

MODEL 378 ▶

A space saving forced air furnace

A compact, fully automatic, factory wired and assembled unit, ready for installation in closet, basement or utility room. 82,500 B.T.U. output.

GET BEHIND **EVANS**.

EVANS has the answers in BASIC SALES ADVANTAGES THAT ARE REAL SALES PRODUCERS

From twenty-five years of experience as one of the world's largest manufacturers of heating and air moving devices EVANS brings you a line of heating equipment tailored to meet *your* sales requirements.

Only EVANS gives you a line designed to keep your inventory low, your profit margin high, and your installations simple. Here are the facts! See how they meet your needs . . . and you'll want the EVANS line.

Only EVANS brings you 4 basic units that cover 84% of your heating installations

4 for 84 MEANS BIG SALES VOLUME WITH SMALL INVENTORY

When you handle the EVANS line you stock only 4 units to economically and profitably sell 84% of the heating market.

4 for 84 MEANS FAST SIMPLE INSTALLATIONS

Each Evans unit is completely assembled, wired and packaged . . . may be installed in hours, not days on combustible floors within two inches of walls.

4 for 84 MEANS THE RIGHT EQUIPMENT FOR ANY INSTALLATION

Evans automatic furnaces fit in closet, utility room or basement. Evans floor furnace takes no room space, fits in the floor. Evans automatic conversion burner fits any type furnace.

4 for 84 MEANS LESS SERVICE, FEWER TROUBLE CALLS

Evans vaporizing burners are efficient and quiet . . . no moving parts . . . no mechanical troubles . . . no service problems.

4 for 84 CUTS YOUR COSTS AND THE CUSTOMER'S COST

With Evans you sell the *total* low costs of oil-saving automatic heating. 1. Low first cost. 2. Low installation cost. 3. The lowest operating cost.

4 for 84 MEANS EFFICIENT, FUEL SAVING DESIGN

The Evans line is specifically designed to provide small and medium size homes with low cost completely automatic heat.

EVANS PRODUCTS CO. — HEATING & APPLIANCE DIVISION • PLYMOUTH, MICHIGAN

MODEL 598

A new low cost gravity-fire
small homes

A new conversion burner that makes possible low cost completely automatic heat at an operating cost small home owners can afford. Fits any type furnace. 100,000 B.T.U. output

MODEL 458

A low cost automatic floor furnace that takes no room space at all

This compact oil-fired furnace fits flush in the floor—no basement needed. It provides all the heating comfort you would expect from a full-sized basement installation. 50,000 B.T.U. output.

You can sell an EVANS automatic oil-fired WATER HEATER with every installation

May be installed anywhere—no gas or electricity needed. Provides more hot water at less cost than any other type of water heater. 45 gal., 30 gal., 20 gal. sizes

THE LINE THAT'S ENGINEERED TO MEET SALES REQUIREMENTS

WHAT'S YOUR VOTE?

DO YOU WANT... DUCT INSULATION that's

X	**EXCEPTIONALLY ECONOMICAL?** Fiberglas Coated Duct Insulation is lower in price than any material available for this application today.
X	**AVAILABLE FOR BOTH INSIDE AND OUTSIDE SURFACES?** Fiberglas Coated Duct Insulation has been tested and proved for both inside and outside surfaces of the duct—the only material offered for *both!*
X	**IDEAL FOR PAINTING OR FINISHING?** Fiberglas Coated Duct Insulation provides a smooth surface, pleasing in appearance—one that may be painted or finished to harmonize with any interior finish.
X	**EROSION-RESISTANT?** Extensive tests at high air velocities up to 5,000 feet per minute have proved Fiberglas Coated Duct Insulation to be entirely satisfactory. You can use it safely on inside surfaces of duct work.
X	**SUITABLE FOR ALL DUCT WORK?** Fiberglas Duct Insulations are the only materials available in forms to suit every application requirement.
X	**FLEXIBLE?** Fiberglas Duct Insulations are available not only in conventional semirigid form, but in the new flexible type ideal for curved surfaces.
X	**HIGHLY EFFICIENT?** Fiberglas Duct Insulations have an exceptionally low thermal conductivity—as low as any available, lower than most.
X	**FIRE-RESISTANT?** Fiberglas Duct Insulations, made of inorganic-base material, will not support combustion.
X	**LIGHTWEIGHT?** Fiberglas Duct Insulations are easy to handle, even overhead. They require no special strength members to support them.
X	**MOISTURE-RESISTANT?** The basic material of which Fiberglas Duct Insulations are composed is resistant to the effects of moisture or condensation, will not rot or decay, will not corrode adjoining metal surfaces.
X	**EASY TO APPLY?** Fiberglas Duct Insulations may be cut to shape with an ordinary knife. No special tools, techniques or skills are required.

THE TREND IS TOWARD

IN WATER HEATERS

IN RANGES

IN BOILERS

IN INDUSTRIAL OVENS

only FIBERGLAS*

INSULATIONS GIVE YOU ALL THESE FEATURES

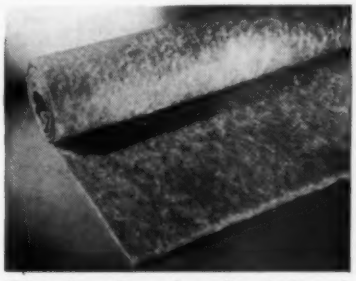
Fiberglas *Coated* Duct Insulation is a new, efficient duct insulating material with a special exterior coating that makes it easier to handle, easier to paint or cover when used on *outside* surfaces of ducts. It is resistant to erosion by high-velocity air streams when applied to inside duct surfaces. Fiberglas *Coated* Duct Insulation is the most economical material available today for *interior* applications, offering satisfactory erosion protection. It is the *only* material offered for *both*.

No matter what the requirement, there is a Fiberglas Duct Insulation available to do the job effectively and economically: Fiberglas *Preformed* Insulation, an all-purpose board-type, easy to shape and easy to apply; Fiberglas *Superfine* Insulation, a lightweight, flexible type ideal for concealed and curved ducts; Fiberglas *Insulating Wool*, available in batt or roll form for any number of requirements; Fiberglas *AE* (Asphalt-Enclosed) *Board*, *Metal Mesh Blankets*, and *Sewn Blankets* are for special duct insulation applications and various temperature ranges. No other manufacturer offers you as wide a range of duct insulating materials—and no other has such a record of acceptance. For complete information, write to Owens-Corning Fiberglas Corporation, Department 930, Toledo 1, Ohio. Branches in principal cities.

In Canada: Fiberglas Canada Ltd., Toronto, Ontario.

Fiberglas Duct Insulation is available in both flexible (at top) and coated forms (below), each easy to apply. Both have a thermal conductivity as low as any comparable insulation—lower than most.

*FIBERGLAS is the trade-mark (Reg. U. S. Pat. Off.) of Owens-Corning Fiberglas Corporation for a variety of products made of or with glass fibers.



Fiberglas Superfine Insulation is lightweight, flexible, highly efficient —useful to 600°F.

Fiberglas PF (Preformed) Insulation possesses excellent acoustical properties, is available in 5 degrees of rigidity—useful to 600°F.

Fiberglas (TW-F) Insulating Wool is a general-purpose type available in batts and rolls—useful to 1000°F.

FIBERGLAS

OWENS-CORNING

FIBERGLAS

THERMAL INSULATING MATERIALS

A NEW GEM in

INDEPENDENT PNEUMATIC TOOL COMPANY

Aurora, Illinois

Export Division: 330 West 42nd Street, New York 18, N.Y.

Birmingham Boston Buffalo Chicago Cincinnati Cleveland Denver Detroit Houston
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the Thor Silver Line

A new symbol of distinction in high quality, high lustre portable electric tools—*by Thor.*

PACKAGE OF STALL-PROOF POWER!

. . . the smallest, lightest, most POWERFUL ½-inch portable electric drill in the world – a statement no other manufacturer can make!

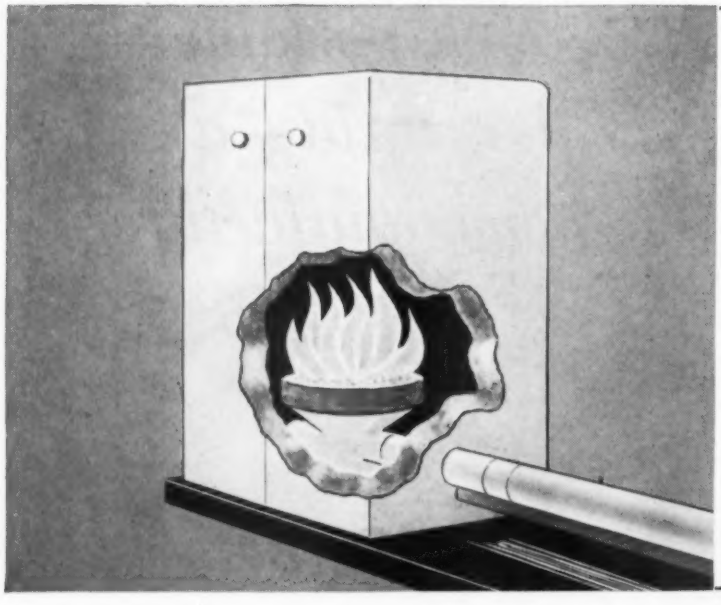
Thor PORTABLE POWER TOOLS

PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS

There are no IFS, ANDS, OR BUTS

about keeping warm this winter when you recommend

Automatic Anthracite Equipment...



AUTOMATIC ANTHRACITE STOKERS

When installed in an existing boiler or furnace and in new houses, reliable automatic hard coal stokers quickly deliver *plenty* of steady, comfortable heat . . . save up to 50% on fuel bills . . . eliminate fuel worries.

Home owners won't have to keep thermostats turned down to the uncomfortable 60's and 70's to conserve fuel. They can have *all* the heat they *want, when* they *want it!*

Approved Automatic Anthracite Stokers

ALLEN STOKER
ANCHOR STOKER
CATSKILL STOKER
COOPER STOKER
ELECTRIC FURNACE-MAN
FAIRBANKS-MORSE STOKER
FUEL SAVERS STOKER
IRON FIREMAN
MOTORSTOKOR
STEWART-ROGERS STOKER
VAN WERT STOKER

Here's the Best Answer to Shortages of Other Fuels and Soaring Costs!

Regardless of the heating requirements of your customers, there's an anthracite heating unit to fill their needs.

Automatic anthracite heating equipment cuts fuel bills! This is an important fact these days of soaring costs. Important to you . . . important to the home owner.

Anthracite is in no danger of short supply. There will be plenty of hard coal to keep your customers warm and comfortable this winter and for the years to come.

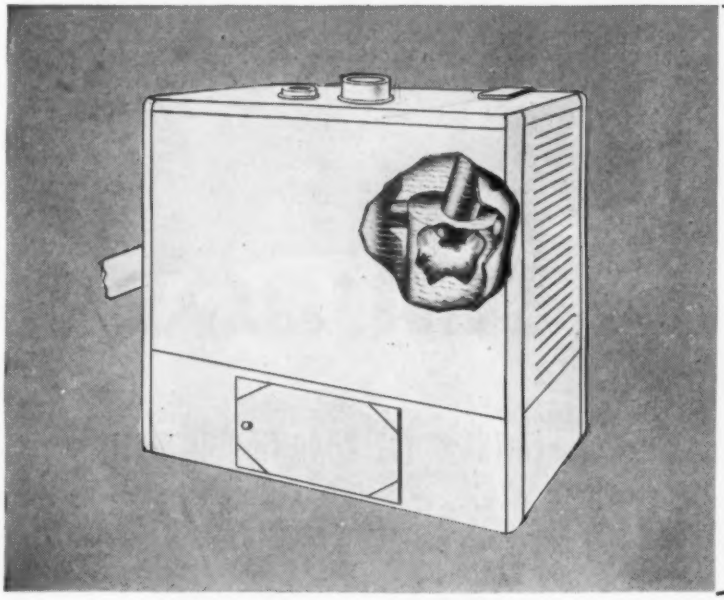
A whole winter's supply of hard coal can be stored easily. This eliminates all worry about fuel for the entire cold season.

Home owners want clean, comfortable, economical, worry-free heat—and plenty of it! They have *just that* when you recommend automatic anthracite heating equipment.

Look over the two main types of automatic heating equipment shown here, then get more detailed information from us.

ANTHRACITE INSTITUTE

101 Park Avenue • New York 17, N. Y.



THE REVOLUTIONARY ANTHRATUBE

The Anthratube saves up to 38% on fuel bills. Its proved efficiency is over 80%. This compact boiler-burner unit with "Whirling Heat" and other revolutionary features produces quicker response and superior performance compared with heating units using other types of fuel.

This unit burns an economical size of plentiful anthracite. It's completely automatic from bin feed to ash removal. It delivers up to 130,000 B.T.U's.

Approved Manufacturers of the Anthratube

AXEMAN-ANDERSON COMPANY
BETHLEHEM FOUNDRY & MACHINE CO.

for COAL · GAS · OIL

Luxaire's 3 in 1 all fuels air conditioning unit

Fits any job!

. . . because

Luxaire's 3 in 1 unit is engineered for COAL hand fired—stoker fired Easily converted and well adapted for OIL and GAS

Luxaire's "3 in 1" unit takes care of the present heating requirements of any home heating installation because it is engineered to do a 3-way job.

When desired, a coal burning installation may be converted at any time to stoker, oil or gas firing.

Luxaire design, that provides a rugged, steel heating element, with long fire travel and large heating surfaces make this an ideal unit for any fuel. Joints and seams are welded leak-proof and gas-tight.

You're in on any job with Luxaire's "3-in-1" all fuels air conditioning unit.

No. AC-700-F
Air Conditioning Unit

THE C·A·OLSEN MANUFACTURING COMPANY

Luxaire HEATING & AIR CONDITIONING UNITS

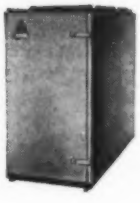
ELYRIA 12, OHIO

Series G
Gas-Fired, Steel
Gravity
Furnace

Series H
Gas-Fired, Utility
Steel Air
Conditioning Unit

Series CA
Gas-Fired, Cast
Iron Air
Conditioning Unit

Series O
Oil-Fired, Steel
Air Conditioning
Unit



Series VH
Oil-Fired, Steel
Utility Air Con-
ditioning Unit

Series 700
Coal-Fired, Steel
Gravity
Furnace

Series C
Coal-Fired, Cast
Gravity
Furnace

YOUR SKILL DESERVES THE BEST!

SELL WHEELING COP-R-LOY PRODUCTS

FOR A BETTER JOB EVERY TIME
INSIST ON WHEELING COP-R-LOY

GALVANIZED ROOFING

Wheeling

WHEELING CORRUGATING COMPANY • WHEELING, W. VA.

ATLANTA BOSTON BUFFALO CHICAGO CLEVELAND COLUMBUS DETROIT KANSAS CITY
LOUISVILLE MINNEAPOLIS NEW ORLEANS NEW YORK PHILADELPHIA PITTSBURGH RICHMOND ST. LOUIS

NOW... Motors for all who demand Top Quality

If you build motor-driven appliances, you just naturally want them to win and hold trade acceptance and consumer good will. Just as naturally, you will agree that one of the essentials to *long-term* success is a dependable power unit. . . . Therefore, we believe, you will be glad to know that our increased production facilities now enable us to offer to additional customers a steady supply of Packard Sunlight Fractional Horsepower Motors. In short, now you, too, can build ready-made trade acceptance and consumer good will into your products.

PACKARD SUNLIGHT MOTORS
for
compressors
washing machines
power-driven bench tools
ironers
milk separators
milking machines
furnace blowers
stokers
oil burners
water pumps
ventilators
and many other applications

Packard
REG. U.S. PAT. OFF.
TRADE MARK

Packard Electric Division, General Motors Corporation, Warren, Ohio

DEPENDABLE APPLIANCE MOTORS FOR THIRTY-TWO YEARS

Ask for a copy OF THIS NEW *16* PAGE BOOK

Here's a new Moncrief book just off the press that gives complete details of all the latest types of furnace pipe and fittings—Surefit Pipe and Fittings.

Moncrief Surefit Pipe and Fittings are all that the name implies. Die stamped and machine made, they are manufactured to precision standards. They fit accurately! They fit easily and quickly! They fit surely! They lock tightly!

Back of Moncrief Surefit Pipe and Fittings are not only skill and fine workmanship acquired from years of manufacturing experience, but also one of the largest plants in the industry equipped with the most modern machinery.

For either Gravity or Forced Air, the Surefit Pipe and Fittings shown in this new catalog, provide the best method for a streamlined, good-looking and economical installation.

Send for your copy of this book today!

THE HENRY FURNACE COMPANY

Medina, Ohio

HEATING AND AIR CONDITIONING UNITS — MONCRIEF SINCE 1895 — FURNACE PIPE AND FITTINGS

DAY

and

NIGHT

TWO SHIFTS are WORKING

6½ Acres

of Production Floor Space are Being Used—Doing Our Best to Produce Enough Aluminum Furnace Fittings and Quality Registers to Satisfy the Needs of the Industry

CHAR-GALE Aluminum Fittings

—are made to give years of satisfaction to your customers. They are stronger, better looking, longer lasting. Feather-light, they are easier and cheaper to handle and transport. And what a break their light weight is for the installer!

CHAR-GALE Registers

Designed for the modern house. Their quiet good looks are in harmony with today's architecture and furniture; they are engineered for maximum efficiency. Char-Gale means high quality, yet modern production methods make Char-Gale quality available for the mass market.

CHAR-GALE

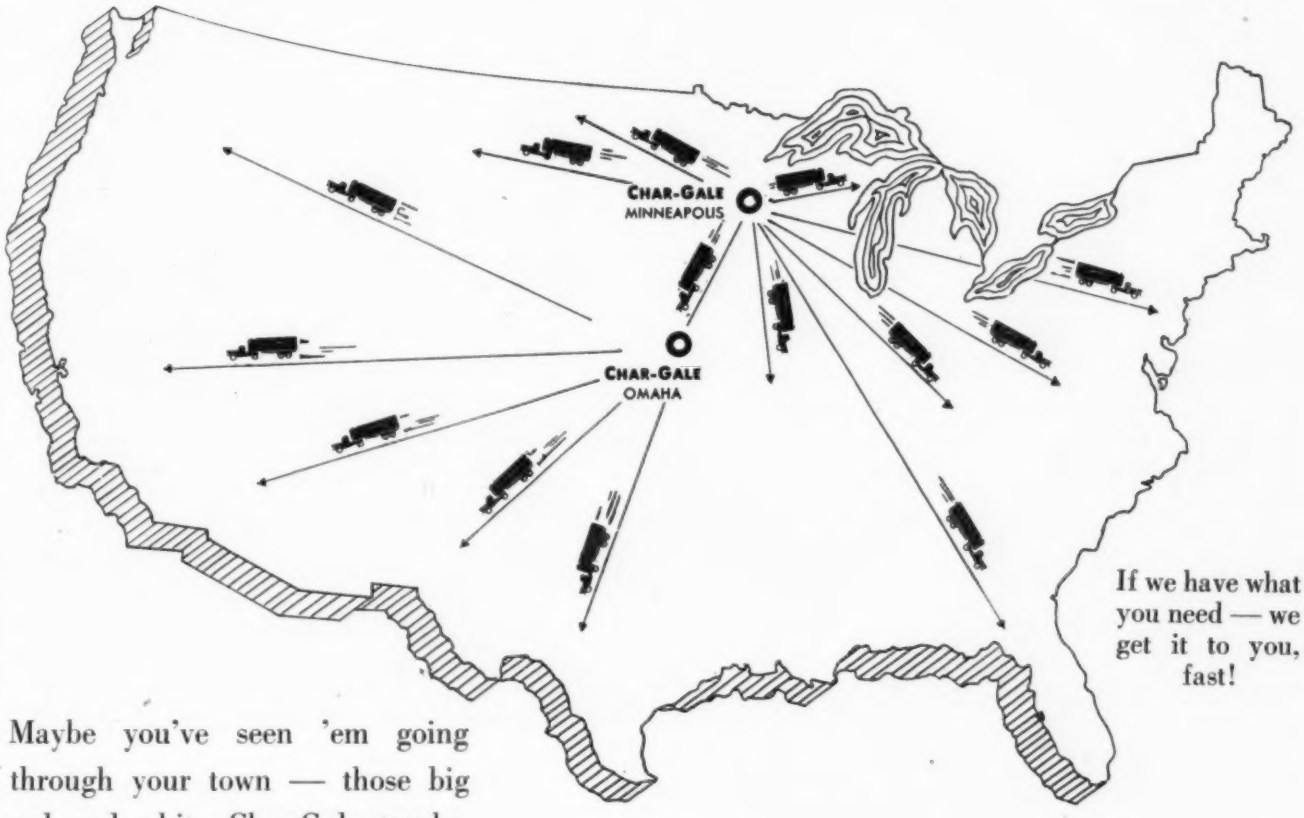
MINNEAPOLIS

FAST-DIRECT DELIVERY

Getting 'em to you as fast as we can make 'em!

CHAR-GALE

Aluminum Furnace Fittings **Registers**



If we have what you need — we get it to you, fast!

Maybe you've seen 'em going through your town — those big red and white Char-Gale trucks. They're carrying aluminum furnace fittings—or Char-Gale registers to customers all over the nation from our two plants in Minneapolis or our other plant in Omaha.

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General Controls new, compact, snap-action, T-70 Thermostat sets a new standard of functional beauty and accuracy in room temperature control. The harmonizing, lustrous stainless steel cover is connected directly to the thermally responsive element so that the entire cover, *sensitive to air temperature and radiant heat*, immediately transmits temperature changes to the control mechanism. Its remarkable sensitivity insures constant heating comfort. It is truly a thermostat that *lives thermally* in the room.

The T-70 Thermostat extends only ⅞" from the wall. Its ivory plastic base acts as a blanket to thermally isolate the thermostat from the wall. From every point of view–both appearance and performance–this thermostat typifies the ultimate in modern engineering design.

THE T-70 SERIES Thermostats are available individually or in General Controls broad line of heating control packaged sets. For complete specifications covering the T-70 Thermostat and General Controls Automatic Pressure, Temperature and Flow Controls for Domestic, Commercial and Industrial applications, request new Catalog.

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Manufacturers of Automatic Pressure, Temperature & Flow Controls

FACTORY BRANCHES: Birmingham (3), Boston (16), Chicago (5), Cleveland (15), Dallas (2), Denver (10), Detroit (8), Glendale (1), Houston (2), Kansas City (2), New York (17), Philadelphia (40), Pittsburgh (22), San Francisco (7), Seattle (1), Oklahoma City (1) • **DISTRIBUTORS IN PRINCIPAL CITIES**

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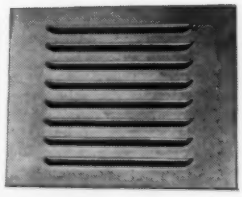
Proves KRW *Value*

● KRW Hydraulic Presses — either Hand operated, Air operated or Motor driven — are so flexible in design and operation, that a little ingenuity plus a few simple and inexpensive dies often result in tremendous time and cost savings.

Gone is the old fashioned theory that most forming, blanking and stamping operations must be done on large, cumbersome presses. On the small run production job illustrated here, a farm machinery manufacturer was able to save considerably in both die and production costs by utilizing a standard KRW 75-ton press and low-cost dies as shown at the right.

Today, the term "arbor press" is a misnomer. In countless plants KRW Presses are doing thousands of jobs that, a few years ago, would have been done on larger equipment. KRW Hydraulic Presses are built in sizes varying from 25 to 100-ton capacities. All but the 100-ton press can be furnished as either hand operated, air operated or motor driven. Openings, bed widths, heights, etc. can be varied at very little extra cost to meet particular needs.

Before you buy a press, remember this truth — more often than not, "you don't need a sledgehammer to drive a tack." You can save plenty by bringing your production problem to KRW first. We're equipped engineeringwise to offer real help, no obligation of course.



INEXPENSIVE DIES AND A KRW PRESS

Illustrated at the left are the low-cost dies used by John L. Bubb Farm Machinery Co. of Baldwinsville, N. Y. on their KRW Press to form louvres in 16 ga. sheet steel as shown at the right. 3 tons pressure is required to shear and 10 tons to form the louvre. This is a highly economical set-up for the limited production necessary.

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100-ton Hydraulic Presses ☐

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For fastening sheet metal to wood, use P-K Hardened Screwnails. They pierce metal that would bend ordinary nails . . . and they have over 4 times the holding power . . . will not work loose, back out or pull out. Because you can be sure they'll stay in once you drive them in, often fewer Screwnails are needed to do the job . . . an extra saving in labor and materials.

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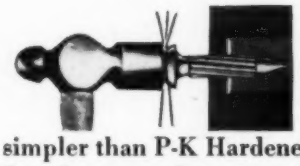

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It gives complete details of P-K Screwnails and Masonry Nails, how and where to use them, with information on punches and masonry drill bits. SAMPLES, too, on request. Just tell us what you are fastening. Parker-Kalon Corp., 200 Varick St., New York 14, N. Y.

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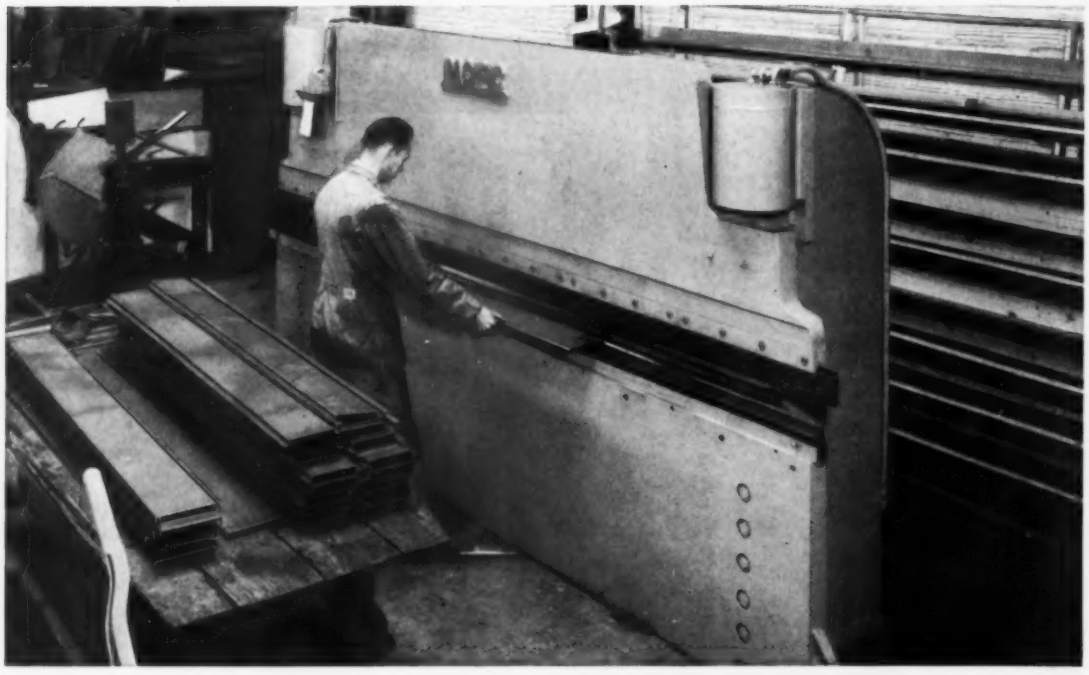

Model 75 Direct-Acting PACIFIC Hydraulic Press Brake forming body panels for refrigerator trucks at the Earl Sherman & Co. plant, Oakland, Calif. This model has a capacity of 10 ga. x 10 ft.; overall die length is 10 ft.

WITH A PACIFIC *Hydraulic* PRESS BRAKE

1. It gets to work quicker... PACIFIC Hydraulic design gives you full pressure at *any* point in its infinitely-variable stroke length. Dies can be set up easier and faster ...*you get to work quicker!*

2. It works faster... Stroke speed varies inversely with stroke length, with a maximum of 30 strokes per minute. On light or heavy work, you'll find that your PACIFIC Press Brake will handle the job as fast as the work can be fed. There's clear working space both in front and in back of the ram, which simplifies handling bulky work pieces.

3. It stays on the job longer...with less down-time... With no gears, clutches or shafts to wear, maintenance is negligible. Factory-set relief valves positively prevent jamming. And because forming is done by smoothly-applied pressure rather than impact, press and dies both last longer.

* * *

There are 26 standard models of PACIFIC Hydraulic Press Brakes, in capacities from 12 ga. x 6' to 1" x 14'... and with overall die lengths to 22'. Larger units are available on order.

If Metal Forming Is Your Business, it will be worth your while to get the facts about PACIFIC brakes. A wire or a letter will bring complete data and prices...

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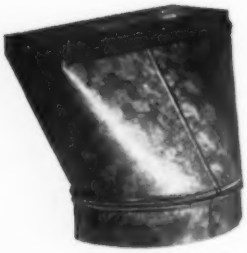
FITTINGS for WARMAIR and AIR CONDITIONING

. . . IN ALL STANDARD SIZES



No. 110 BOOT

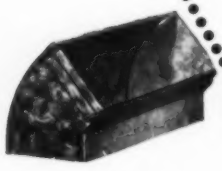
No. 111 BOOT

No. 112 BOOT

No. 113 BOOT

"Snap-Rite—

No. 120



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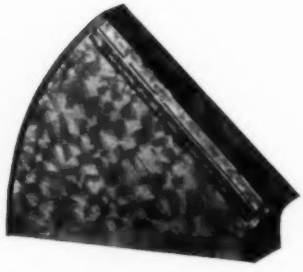
No. 122



No. 123

Fit Tight"

No. 160 Takeoff Round Pipe to carry branch in or below joist.

No. 163 End of Line Takeoff. Can be used left or right with No. 164 for 3 runs off end of line.

No. 164 End of Line Center Takeoff. For use with 2 No. 163.

TAKEOFF SIZES: 4 x 8 TO 6" AND 7" COLLAR—6 x 8 TO 8" COLLAR

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GRAY METAL PRODUCTS, INC.

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Be Prepared for any Fuel Emergency

RYBOLT Coal-Fired Units are Easily Converted to Firing with Gas or Oil, with Little or No Loss of Heating Efficiency

Rybolt Series 15
Cast Iron Coal-Fired Gravity Furnace

Rybolt coal-fired units, cast iron or steel, can easily and quickly be converted to firing with gas or oil, then back again to coal firing if emergency demands. This is a big selling advantage that gives you real protection in case of fuel shortages.

And these conversions can be made with little or no loss in heating efficiency. Rybolt units are correctly designed to burn all fuels efficiently because ample combustion space and adequate heating surfaces are provided.

Rybolt Series 152
Cast Iron, Coal-Fired Winter Air Conditioner.

The units illustrated here, Rybolt Series 15 and 152, primarily designed for hand firing, can also be adapted for stoker firing — another example of their versatility and adaptability to meet every requirement.

For utmost fuel protection, convenience, efficiency and economy, urge your customers to install Rybolt coal-fired heating units. We can make reasonably prompt delivery for this time of year.

THE RYBOLT HEATER COMPANY

615 MILLER STREET ★ ASHLAND, OHIO

tie 'em together ON EVERY JOB

THE NEW VIKING-HUMIDIFIER

● Here's the ideal companion for the new Viking-Blower-Package. Tie in a Viking Humidifier with every Blower installation for real winter air conditioning. It's been made especially to give the proper amount of healthful moisture for forced air jobs. That's the way to insure complete comfort to your customers and to add additional profit for you. And . . . here's a profit you keep because with this new Viking Humidifier no "chase-back" or service calls are necessary to keep it operating properly. Install it and forget it. Your Viking jobber carries it in stock also.

NEW VIKING-BLOWER-PACKAGE

Never has a product in any field made as sweeping a hit with the trade as this new Viking-Blower-Package. Only a few months old and there are already thousands of these "out-of-this-world" units being installed throughout the country. And, no wonder . . . it's the finest looking and easiest selling item in the heating field. Its overall quality and fine engineering makes it the only Blower that runs as "Quiet as a Soft Whisper." Sell the job that's made right to work right with any gravity warm air furnace. Ask your jobber — he knows.

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COPPER *actually costs less!*

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3. SATISFACTION BRINGS *NEW* BUSINESS!

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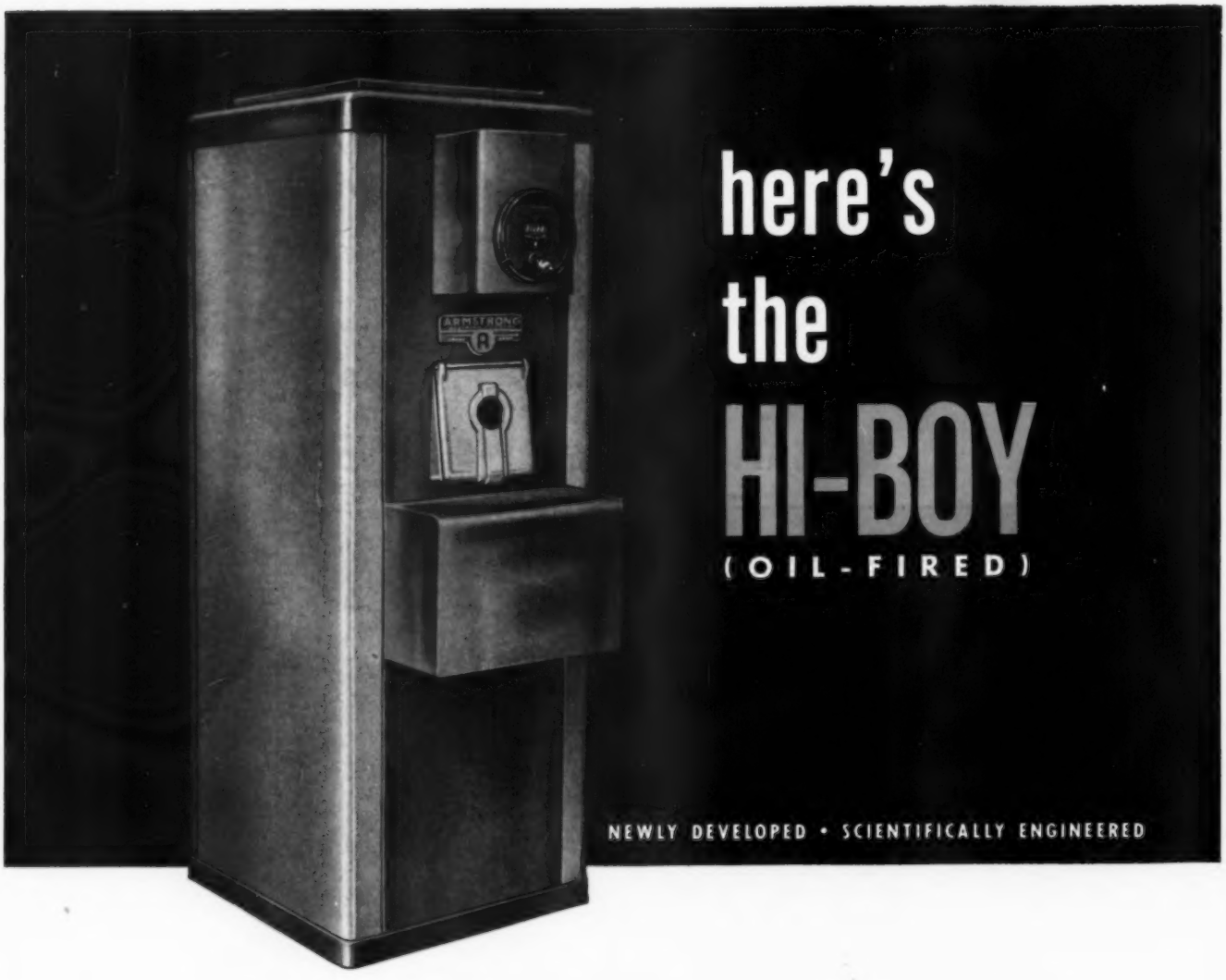


ANOTHER TRIUMPH FOR ARMSTRONG

Here's a timely, sure-fire profit-maker for Armstrong dealers! It's the new Armstrong Vaporizing-Type Oil-Fired Hi-Boy. Developed in the laboratories of the leader in the warm-air heating field, it sells at a really attractive figure. It installs with a minimum of labor. It is built to avoid excessive service demands. It comes to you completely assembled. Its two-tone blue baked enamel cabinet is good-looking enough for a living-room. It occupies less than a square yard of floor space, yet delivers more than 70,000 BTU at the bonnet.

For one-floor-plan homes, for restaurants, shops, offices — or anywhere that floor space is at a premium — it is ideal, and with no sacrifice of efficiency.

The Armstrong Oil-Fired Hi-Boy is approved by the Underwriters' Laboratories, Inc., for installation *against* a wall at the rear and with just nine-inch smokepipe clearance! It meets the requirements of Commercial Standard CS-104 of the United States Department of Commerce.

With this space-saving winter air-conditioner you can *really* get in on the ground floor. Send today for Bulletin 801, hot off the press. It gives detailed description, specifications, dimensions.

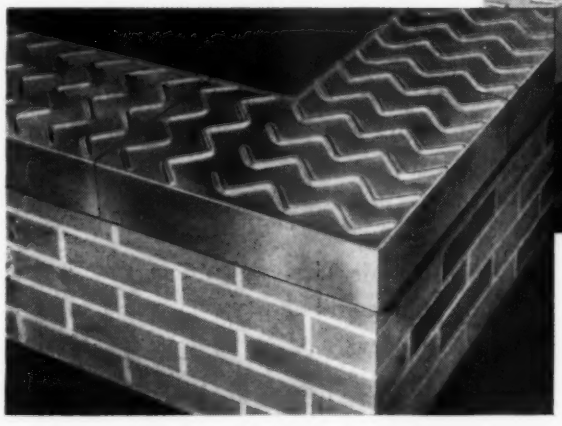
The Armstrong Gas-Fired Hi-Boy is the ideal gas space-saver. The Triple-Fire burns coal, gas or oil. Other Armstrong coal, gas and oil heating units provide a complete line for every fuel, every heating need.

ARMSTRONG
FURNACE COMPANY
COLUMBUS 12, OHIO

Anaconda

THROUGH-WALL FLASHING

drains itself *dry* on a level bed



Wherever through-wall flashing is specified, as it should be for parapets and all masonry walls, this patented Anaconda flashing offers you both efficiency and durability.

Sheet metal men like the die-stamped dam and corrugations that make this flashing easier and faster to lay. End joints are made simply by overlapping and nesting one corrugation. The flat selvage permits neat, sharp bends for counter flashing, without danger of distortion that might spoil drainage. Die-stamped corner pieces (for both inside and outside corners) are nested in place as easily as the straight lengths.

Another important advantage: the embossed dam and zig-zag ridges provide a complete mortar bond in all lateral directions.

Famous as the flashing that "drains itself dry on a level bed", architects and owners approve of Anaconda Through-Wall Flashing because it provides positive, controlled drainage and, being made of Anaconda Copper, long life is assured.

Literature on request.

4856

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Anaconda

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HEATING and **VENTILATING**

at work!

How the **DRAVO** *Counterflo* **HEATER** provides five functions of HEATING and VENTILATING

In addition to its primary purpose of supplying comfor heating for large open areas, a DRAVO *Counterflo* Heate affords four other functional uses—year 'round ventilating tempering make-up air, process drying and heat curing

Obviously not all five functions of a DRAVO *Counterfl* Heater are required in all plants, but every one of these func tional applications can be efficiently provided by this heate

Thousands of DRAVO Heaters provide cold weathe comfort heating, as well as ventilation for warm weather

Industrial and commercial users of various types, par ticularly foundries, galvanizing and paint shops, requir tempered make-up air.

Process drying is the application of heat in removin moisture from heavy textiles, such as rugs, and for dryin foodstuffs, paints, plastics, etc.

Heat curing with low temperatures is still another func tion performed by this versatile "packaged" heating uni

DRAVO *Counterflo* Heaters are self-contained, requirin only fuel line, power line and vent stack for installation Thermostatically controlled, they require no regular at tendant. Structural changes are unnecessary for installa tion. They occupy very little floor space, and can be wall mounted or suspended from roof trusses. Because thei stainless steel combustion chamber eliminates refractor lining, they can be mounted in either a horizontal o vertical position with the assurance of efficient operation

DRAVO Heaters are available for firing with gas, oil o coal. Units burning non-solid fuels can be converted fro one fuel to another quickly. In addition, coal-fired uni can be converted to gas or oil firing.

If you would like to know how the DRAVO *Counterfl* Heater can serve any or all of its five functions in your plan use the coupon below for more information. DRAV CORPORATION, Heating Section, Dravo Building, Fift and Liberty Avenues, Pittsburgh 22, Pa.

DRAVO

DRAVO CORPORATION

DRAVO BUILDING, PITTSBURGH 22, PA.

Clothing manufacture requires nimble fingers and women cannot work efficiently if hands are cold, or if heating equipment causes drafts. Here in a "home temperature" of 70° F. to 75° F., in 25,000 sq. ft. of uninterrupted floor area, 300 women are employed, most of them operating sewing machines and all of them comfortable. Four gas-fired DRAVO *Counterflo* Heaters of 500,000 Btu output each, installed in Connellsville Sportswear Company at Connellsville, Pa., insure comfort for employees and contribute to top working efficiency.

Each heater discharges its 4,500 cfm of warm air in a "cross-fire" over the working area. This provides a comfort zone without drafts or cold spots and minimizes roof heat losses. Fully automatic, all four heaters are set to maintain temperatures 20° F. to 25° F. lower at night than during working hours, thus conserving fuel. In summer, heater fans provide ventilation for the building.

2. Year 'round Ventilating

Federal-Mogul Corporation of Detroit, Michigan operates a large non-ferrous foundry in making anti-friction bearings. Small amounts of contaminated air from smoke, fumes and excessive heat that escape the modern ventilating and exhaust system recently installed are replaced at the rate of 220,000 cfm by 10 DRAVO *Counterflo* Heaters. Each heater has an output of 2,000,000 Btu per hour and discharges 22,000 cfm of tempered fresh air into the foundry.

The DRAVO Heaters not only provide fresh air in the plant but also equalize air pressure so that exhaust equipment operates at top efficiency. For example, exhausting lead fumes is difficult in negative pressure because these fumes are heavier than air and exhaust equipment, therefore, would pull out more air than fumes.

The dual problem of heating and ventilating foundries is complex but it can be solved with DRAVO Heaters as Federal-Mogul has demonstrated.

3. Process Drying

Three of the five functions of the DRAVO *Counterflo* Heater are used by Rempel Manufacturing, Inc., Akron, Ohio where latex rubber toys are molded and vulcanized, then painted. These three functions are: process drying of the rubber toys and molds, comfort heating for the entire plant and year 'round ventilating.

Rempel's modern one-story building, 192′ x 60′ x 18′, has a concrete floor and 12-inch tile walls. Two DRAVO Heaters discharge warm air without drafts, into the working area and provide a comfort zone of uniform temperature. In summer fans are used for ventilating and drying painted toys.

The highly efficient method by which the *Counterflo* Heater produces heat and distributes it makes this unit valuable for process drying. Recent applications include drying of candy, paper, paint, potatoes, oranges, apples, plywood, ceramics and rugs as well as concrete and wall plaster during construction.

4. Tempering Make-up Air

In the manufacture of the Hypressure Jenny, a portable steam cleaning unit, the Homestead Valve Manufacturing Company of Coraopolis, Pa., found it necessary to provide tempered make-up air to ventilate its factory and to provide comfortable working conditions during cold weather. The primary need for replacement air is in three paint spray booths, each requiring 18,000 cfm. Another need is in the area reserved for testing and inspection where fumes of combustion must be carried off continuously.

Two large capacity DRAVO *Counterflo* Heaters introduce tempered make-up air into the testing and spray booth areas at the rate of 44,000 cfm. Eight smaller DRAVO Heaters provide 70° F. working temperature throughout the 40,000 sq. ft. plant. All ten of these oil-fired heaters are controlled automatically by thermostat. Stand-by gas burners are also provided so that the more readily available fuel can be used at all times.

5. Heat Curing

A single gas-fired DRAVO *Counterflo* Heater performs five functions at the Devoncraft Corporation, New York carpet finishing plant for Duraloom Rug Mills, Inc. In addition to *heat curing* the neoprene rug backing, it provides *comfort heating* for the entire plant, *ventilating* during the summer, *tempered make-up air* for the drying and curing rooms and *process drying* of rug and neoprene backing.

In the curing room, 200° F. temperature is produced by continuous recirculation of the air through the DRAVO Heater and into a well-insulated curing room. Processing time for rugs has been reduced to only *two hours.*

The vital part of this unusual heating and ventilating arrangement is the 500,000 Btu output heater which handles 5,500 cu. ft. of heated or unheated air per minute. An elaborate system of ducts, dampers and thermostats enables this single heater to accomplish all five valuable functions.

5 FUNCTION HEATING
with just ONE unit

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Manufactured and sold in Canada by Marine Industries, Ltd., Sorel, Quebec

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3 We would like to know more about DRAVO *Counterflo* Heaters for:

Name_____ ☐ **Comfort Heating**

Title_____ ☐ **Year 'round Ventilating**

Company_____ ☐ **Process Drying**

Address_____ ☐ **Tempering Make-up Air**

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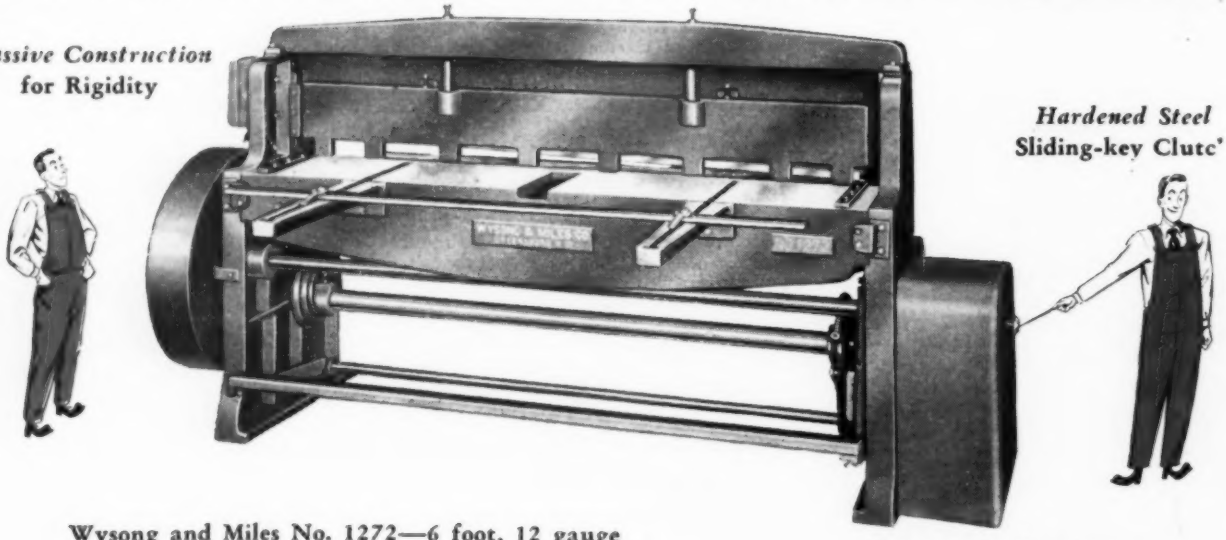
P-6386

Economical...CLEAN BURR-FREE SHEARING

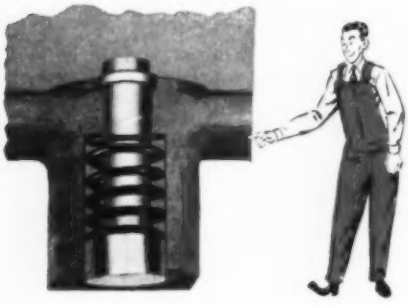
Massive Construction
for Rigidity



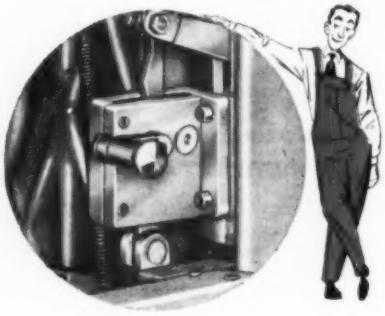
Hardened Steel
Sliding-key Clutc'

Wysong and Miles No. 1272—6 foot, 12 gauge

Compensating Action
of Each Holddown Foot



Non-Repeat Unit
for Safety



Precision Back Gauge
Adjustable to .0078 inch

PRECISION FEATURES INSURE SPEED AND ACCURACY

You'll get long, dependable performance from this finely engineered *Wysong and Miles* Power Squaring Shear. Built for economy, it has the precision features necessary for rapid, safe and accurate shearing in the production rush of today . . . operators are enthusiastic about the fine work done by this improved squaring shear, on the job in sheet metal plants throughout the country.

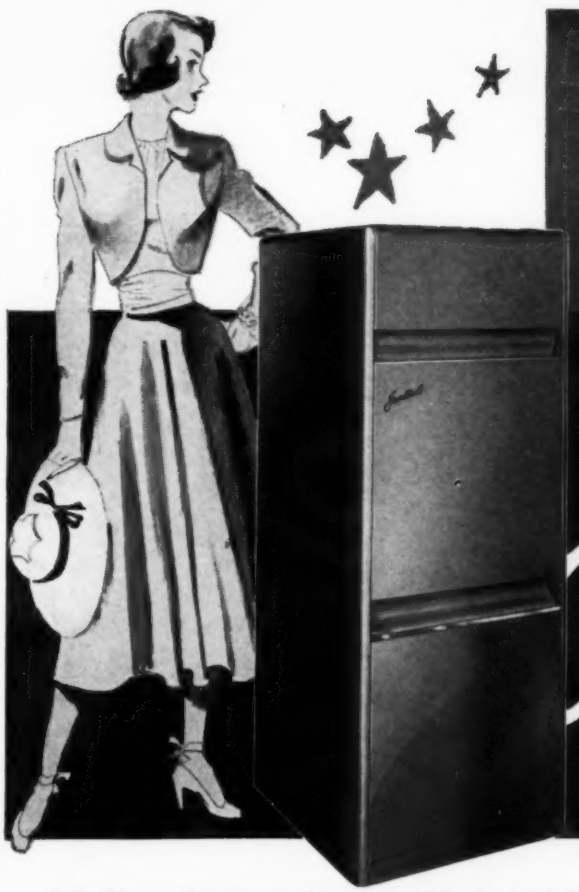
The parallel, ball-bearing back gauge can be quickly changed in units of .0078 (1/128th) of an inch by a handwheel dial reading. The individual spring actuated plunger in each holddown foot acts as a powerful independent clamp . . . metals of varying gauges or narrow strips can be sheared without adjustment. The non-repeat unit of the positive hardened steel clutch stops shearing action after each cycle; or it can be set for continuous shearing. High speed blades are standard equipment. Other *Wysong and Miles* Power Squaring Shears in *8 foot, 12 gauge; 6 foot, 10 gauge; 6 foot, 14 gauge; and 52 inch, 14 gauge capacities.*

Write for complete information on Wysong and Miles Sheet Metal Machines . . . *Motorized, Air-Power and Foot-Power Squaring Shears; Power and Hand-Operated Bending Rolls; Combination Machines.*

WYSONG and MILES Co

621 FULTON STREET GREENSBORO, NORTH CAROLINA

THE FINEST IN SQUARING SHEARS AND BENDING ROLLS



new

From Head to Toe

THE IMPROVED *Janitrol* WINTER AIR CONDITIONER

Brings You 12 New Sales-Clinching Features

INCORPORATING TIME-PROVEN DESIGN PRINCIPLES

(1) New Improved, Long-Life, Cast-Iron Heat Exchanger. Provides easier removal of top plate flue gas collector and new interior suspended alloy steel turbulators.

(2) Twin Air-Flow Ventilating Louvres. Admit a direct flow of ventilating air to assure the cool operation of all controls.

(3) New Type Ribbon Burners. New design, features a quickly removable, steel burner chassis. Burner ribbons are nested in an open top holder for easy removal. Burners suitable for all gases including L P.

(4) New, Plug-in, Self-Positioning Electrically Operated Pilot. Plugs into regular type electrical outlet, can be removed in seconds. New actuating lever and switch design assure long-life positive operation.

(5) Combination Fan and Limit Control. Switch mechanism and thermal element are factory set in the most convenient and accessible location.

(6) Standard Dimensions, All Parts and Controls Completely Enclosed. All six sizes are a standard 26" in depth, and 60" high, only the width changes. All units are crated, easily moved through standard size door.

(7) Large Capacity Blowers. Rubber cushioned blower chassis support cradles the blower, absorbs all vibration, results in quiet operation.

(8) Over-Size Filters. Double filter suspension assures clean circulated air at all times.

(9) Accessible Control Assembly. All units of the control and burner assembly are compact. Can be inspected and serviced by removing upper front cabinet panel.

(10) Duct Mounted Humidifier. Shipped separately. Usually located in the supply duct near the Conditioner after installation.

(11) C-A-C Operation. All units can be factory adjusted for continuous air circulation operation.

(12) Smart Styling. The New Janitrol looks different it *is* different.

Your Janitrol representative has complete Specification and Performance data on this new Winter Air Conditioner. He can supply any information you may require.

SURFACE COMBUSTION CORPORATION • TOLEDO 1, OHIO

BETTER *jobs for your customers...*
MORE *jobs for you*

Gutters, downspouts, flashing and other roofing accessories

—*built of U·S·S Stainless*

IN your community practically every home and public building, old or new, is a prospect for these roofing parts that insure the ultimate in roof drainage and that are unsurpassed for durability, lasting good looks and long, trouble-free service.

With Stainless Steel these benefits are readily obtainable — and at *no premium in price.* Actually the initial cost of properly designed Stainless Steel gutters, downspouts, and flashing need not be any higher than when made from other materials which are inferior in strength and corrosion resistance. And when it comes to ultimate cost, Stainless Steel is by far the cheapest material to use because it eliminates replacement and maintenance expense—*first cost is final cost.* Just point out these facts to your customers and watch them respond.

Fabrication is easy—and U·S·S Stainless is available

Fabrication of these comparatively simple forms presents no special problems. The usual sheet metal shop equipment is adequate and practices are similar. The additional stiffness of Stainless causes little difficulty because gages used are usually thinner than those customary in other materials. For most applications, 26 gage is recommended.

U·S·S Stainless Steel sheet and strip is *readily available now.* The proper grade—U·S·S 18-8, Type 302—is stocked by most warehouse suppliers and by United States Steel subsidiaries. If you want further information, write to Carnegie-Illinois Steel Corp., 2059 Carnegie Bldg., Pittsburgh 30, Pa. for our catalog "Roofing Products of Stainless Steel," now in preparation, and we'll put you on the list for an early mailing.

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
CARNEGIE-ILLINOIS STEEL CORPORATION, PITTSBURGH & CHICAGO
COLUMBIA STEEL COMPANY, SAN FRANCISCO · NATIONAL TUBE COMPANY, PITTSBURGH
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM
UNITED STATES STEEL SUPPLY COMPANY, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

U·S·S STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

8-939

UNITED STATES STEEL

MOR-SUN

Rings in the NEW... and Clings to the $ OLD!

NEW! Yes, the factory-assembled MOR-SUN Furnaces have many *new* added features — many advances and developments resulting from MOR-SUN'S continuous laboratory and field research.

OLD! Despite these improvements — despite these additional new improvements, MOR-SUN furnaces because of their *precision* mass production, are still LOW PRICED . . . still at levels competitive to furnaces made of light gauge steel.

MOR-SUN gives you PRODUCT plus PRICE . . . plus *the permanence of a profitable policy!*

Your MOR-SUN representative will be glad to give you the story of all that MOR-SUN can mean to you.

MORRISON
STEEL PRODUCTS, INC.
BUFFALO 7, N. Y.
"The Sun Never Sets with MOR-SUN!"

"SUNNY" MOR-SUN

AIR EQUIPMENT TO HELP YOUR BUSINESS

FANS by "Buffalo"

EQUIPMENT FOR

★ VENTILATING
★ HEATING
★ COMFORT COOLING
★ PROCESS COOLING
★ AIR TEMPERING
★ AIR WASHING
★ EXHAUSTING
★ BLOWING
★ FORCED DRAFT
★ INDUCED DRAFT
★ PRESSURE BLOWING
★ CLEANING
★ DRYING

SHORT ON SPACE REQUIREMENTS

LONG ON QUIET DELIVERY

"Buffalo" AXIAL FLOW FANS

• "Limit-Load" feature! Motor can't overload.
• Minimum turbulence! Straight-line flow!
• Wide choice of sizes, to fit the job exactly!

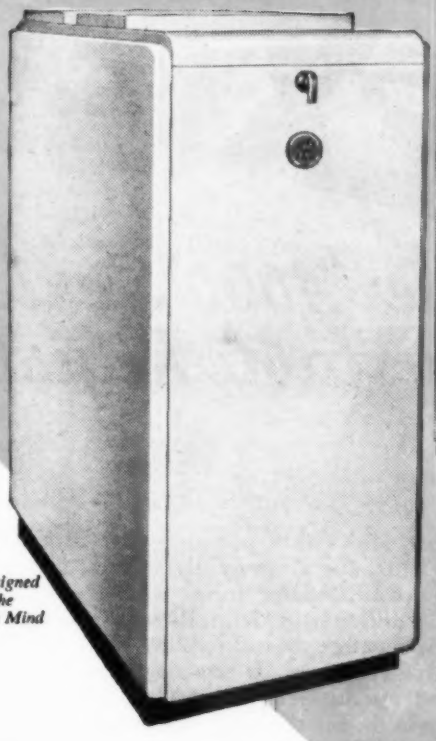
When you need a fan to fit into cramped quarters in straight-line air delivery—but still need plenty of capacity—look into the "Buffalo" Axial Flow line! In both Tube-axials and Vaneaxials, these compact fans are giving excellent service where centrifugal fans could not easily be fitted. Too, their light weight enables mounting on walls or ceilings—many being in use exhausting from hoods over vats. For the higher pressures, we recommend the Vaneaxial type, with its directional inlet vanes which reduce waste rotary air motion.
For best satisfaction in such installations, use "Buffalo" Axial Flows! Write for Bulletin 3533-C for your files.

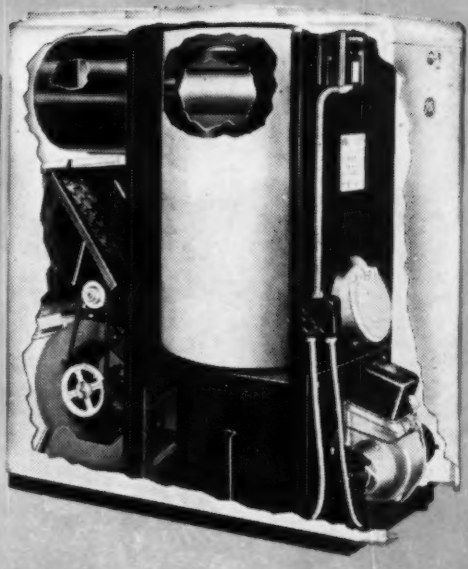
BUFFALO FORGE COMPANY

504 Broadway, Buffalo, New York
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.
Branch Offices in all Principal Cities

CUTTING AIR COSTS IN EVERY BRANCH OF INDUSTRY

Easy to Stock! Easy to Install! Designed for oil or gas!





Four Conditioners—Two Furnaces

AS 12 (small) Gas; 72,000 Btu output—Oil; 75,000 Btu Bonnet capacity.

AS 23 (medium) Gas; 92,000 Btu output—Oil; 90,000 Btu capacity Registers.

Whiter-white Richmond Enameled steel jacket—23" wide x 47" deep, 54" low.

Steel base and channels—no "grouting" needed.

*Unit illustrated: Furnace #AS 23 with gun-type oil burner.

A Unit Designed With The TRADE *In Mind*

Richmond's "Two for One" Winter Air Conditioners

New dual-fuel furnaces save you money on Storage, Installation, and Inventory . . .

Easy to Stock: Furnaces can be used for either oil or gas installations, saving you up to 50% on your furnace storage and inventory costs. Each furnace shipped completely assembled in one carton (weighs less than 395 lbs.) with burner units packed separately.

Easy to Install: Furnace unit *only 23" wide*—will pass easily through average size door. Locate furnace, place combustion and burner assembly in furnace unit, spin four wing nuts and make electrical connections at junction box. Then you're ready for supply and flue connections. You'll welcome Richmond speed and ease of installation.

Easy to Change-over: You can switch from oil to gas (or vice versa) without removing the furnace unit or disrupting duct work. Simply disconnect present burner from mounting plate, wiring and supply lines; then slip the new burner into place and connect up. Change-over is accomplished with the minimum of time and expense.

RICHMOND PLUMBING & HEATING

RICHMOND RADIATOR COMPANY
AFFILIATE OF REYNOLDS METALS CO.

Back In 1867 It was either coal or wood—but . . . "We've Come A Long Way Since Then"

Plumbing Fixtures: Enameled Cast Iron Ware Vitreous China Perma Glass
Heating Equipment: Oil & Gas Winter Air Conditioners Gas Boilers Radiators

CLIP AND MAIL COUPON TODAY

Richmond Radiator Company
19 East 47th Street, New York 17, N. Y. AA-10

Gentlemen:

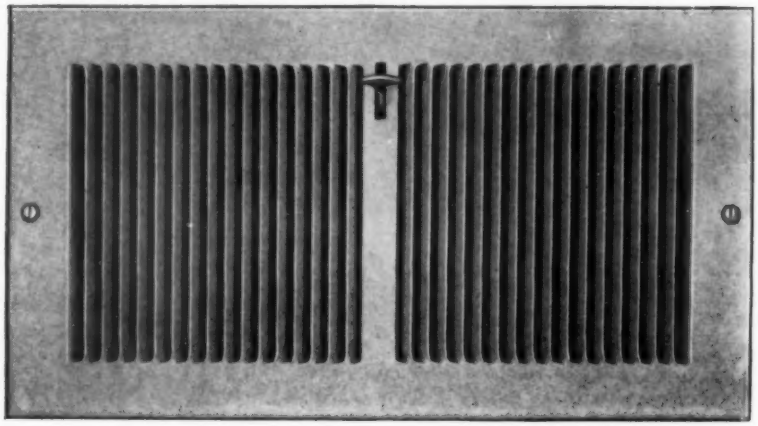
I am interested in the New Richmond "dual-fuel" Winter Air Conditioner. Please send me full details. No obligation, of course.

Name.....

Company.....

Address.....

Now Made for Right or Left Direction

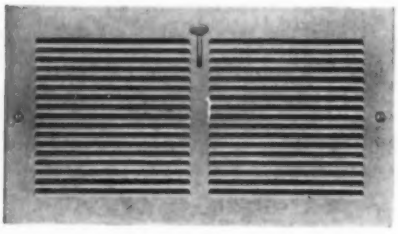


AIRO-FLEX

Auer "4000" Series Adjustable Registers

Auer now offers this popular Airo-Flex model with *vertical* adjustable fins, for sideway directional flow. For your forced air or air conditioning jobs, where single or 2-way lateral deflection is sufficient, this moderate priced, top quality design, in both appearance and efficiency, may well be classed with more expensive registers. It has single valve, operated by exclusive, patented spring tension device, permanently positive. Fins are bendable on the job (set when shipped at 22°, half left, half right). This "4000" Series is unusually neat and substantial in construction, well turned out and finished, really a credit to any job. Available in usual wall or baseboard types, also intakes.

Airo-Flex "7000" Series has horizontal fins with up or down deflection.



Auer makes a complete line of modern and attractive floor, base, and wall registers and return faces—designed and styled by experts—for gravity or air conditioning, including all directional types. We also supply flat stamped metal grilles, in all materials and sizes, for ventilation, concealment, enclosure or other purposes.

Ask for Auer Register Book — or Special Grille Catalog!

THE AUER REGISTER CO., 3608 PAYNE AVENUE, CLEVELAND 14, OHIO

Auer REGISTERS
& GRILLES for AIR CONDITIONING & GRAVITY

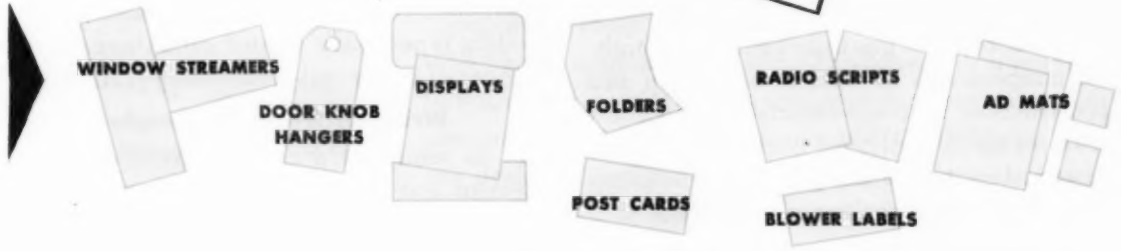
NOW IS THE TIME...

TO BOOST YOUR PROFITS WITH DUST-STOPS

Now is the time to promote 'em—to sell 'em—when the more than 2½ million owners of forced-warm-air heating systems require air filter replacements. Now, in the next several months, a big advertising campaign in BETTER HOMES & GARDENS, AMERICAN HOME, HOUSE & GARDEN and HOUSE BEAUTIFUL will remind those owners to have their filters changed. So, *now is the time* for you to tie in with this campaign and get yourself more business with *extra profits* . . . from additional service jobs as well as filter sales.

Your DUST-STOP distributor or jobber is ready *now* to supply you with free tie-in advertising materials . . . and give you prompt delivery on DUST-STOP Air Filters. Contact him today. Owens-Corning Fiberglas Corporation, Dept. 930, Toledo 1, Ohio. In Canada, Fiberglas Canada Ltd., Toronto, Ontario.

HINT
MEMO
TO GOOD HUSBANDS WITH BAD MEMORIES
Another Heating Season is here . . . time to replace dirty filters!
DUST STOP
AIR FILTERS



DUST STOP® AIR FILTERS

®T. M. REG. U. S. PAT. OFF.

—a Fiberglas* product

Gas-Tight Joints *made easily* with FIREITE*

Fireite goes on quickly, forms tight seal

HERE is an easily worked sealing cement—ready mixed, ready to use—which you can quickly apply to any clean surface. It air-sets or heat-sets equally well into a practically indestructible joint.

Fireite remains gas-tight against the highest temperatures as well as expansion and construction strains—especially important features on domestic oil burner and stoker installations where airtight, gas-tight joints are essential for efficient combustion.

Fireite Asbestos Furnace Cement has minimum shrinkage, does not crack, crumble or bloat. It keeps well on the bench and in the container . . . is odorless.

Use Fireite for mounting or repairing heating equipment—for setting ash pits and fire pots, doors, dampers and other places where sealing is necessary. With Fireite there is less danger of costly call-backs for re-sealing.

Write for free 4 lb. sample

Let us send you a can of Fireite Furnace Cement and a copy of folder RC-7A. Simply write giving your name and the name of your company. Address Johns-Manville, Box 290, N. Y.

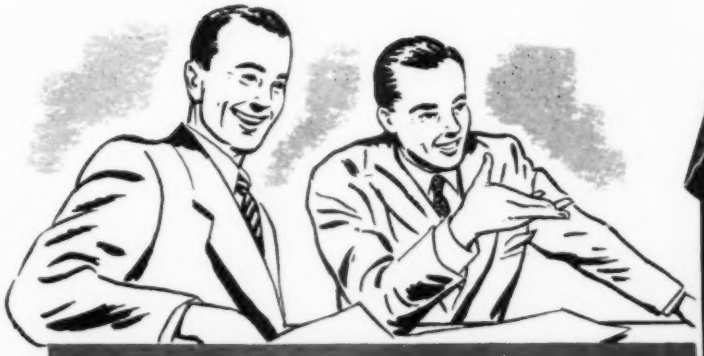
JOHNS-MANVILLE JM PRODUCTS

*Reg. U. S. Pat. Off.

Johns-Manville **FIREITE** **asbestos furnace cement**

"It's the VICTOR LINE for '49!"

Quality Furnaces Since 1890



"THOSE PATENTED FINS SELL MORE FURNACES"

That's Only ONE Reason Why the

VICTOR

HEAT RADIATING FIN FURNACE LINE will Make You More Money in '49

Write us . . .

The new addition to our plant will greatly increase production of the VICTOR FIN furnace line in '49. Be ready. Write us NOW, while new accounts are being added.

"And, Man, there are plenty of other reasons, too! Whether its a square winter air conditioner or a round furnace, every VICTOR has exclusive features of genuine merit which *make sales easier*. VICTOR FIN furnaces are designed and built of husky boiler-plate steel to give a life-time of dependable, economical, service-free heating comfort. In appearance, engineering, construction, efficiency and SALES APPEAL . . . the VICTOR line is unsurpassed!"

COAL • GAS • OIL FURNACES • OIL BURNERS • STOKERS • BLOWERS • ACCESSORIES

HALL-NEAL FURNACE CO.

VICTOR *Quality Furnaces Since 1890*

1322 N. CAPITOL AVENUE · INDIANAPOLIS 7, INDIANA

The Alnor Velometer Jr., 4" x 3" x 1½"; available in single or double range scales; double-pivoted, double-jeweled movement for increased accuracy.

Announcing the New Alnor Velometer Jr.!

Here's the *new* Alnor Velometer Jr.—Illinois Testing Laboratories' most recent perfection in precision air velocity measurement instruments. A small, portable, completely self-contained unit, the new Velometer Jr., answers a long felt need for an accurate, instantaneous direct reading instrument that is *low in cost.*

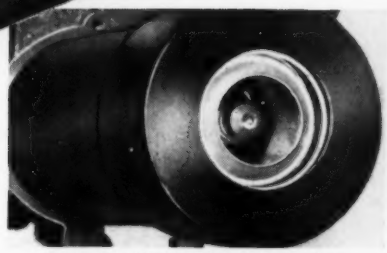
Amazingly accurate . . . easy to read, this inexpensive Velometer gives direct reading of air velocity in feet per minute *without* bothersome timing, calculations or reference to tables and charts. The new Velometer Jr., can be adapted to a score of uses when installing new work or maintaining efficient operation of established systems. Send for bulletin and prices!

Alnor PRECISION INSTRUMENTS FOR EVERY INDUSTRY

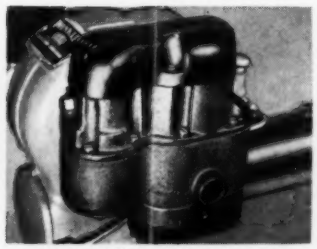
ILLINOIS TESTING LABORATORIES, INC.
Room 538, 420 N. La Salle Street, Chicago 10, Illinois

BURNED ONLY 5½ GALLONS...

IN 24 HOURS... CUT FUEL CONSUMPTION TO LESS THAN 1/3



Exclusive Winkler Flame Controller



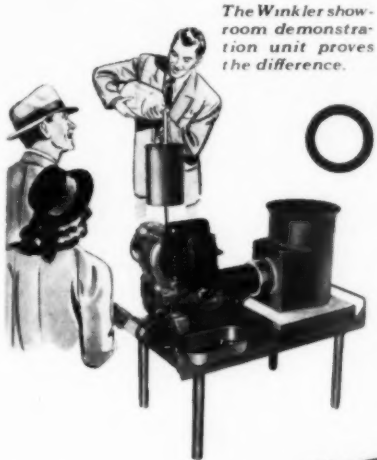
Exclusive Winkler Metering Unit

THE NEW WINKLER

LP*

OIL BURNER

*LOW PRESSURE



The Winkler showroom demonstration unit proves the difference.

Two facts will hit you when you read this! First, that the new Winkler LP* Oil Burner performs in a way never before witnessed. Second, that *you can sell this burner now* . . . to countless home owners fed up with the extravagant waste of conventional oil burners.

An Illinois dealer writes—

"Last October we installed a Winkler LP* in a Palatine, Ill., residence. At zero outdoor temperature, the old burner was burning 17½ gallons every 24 hours. Under the same conditions, the Winkler LP* burned only 5½ gallons in 24 hours.

"We have installed seven Winkler LP* Burners up to the present time and have had no service calls."

Here's why the Winkler gives this miraculous kind of service. It can be made to burn *as little as ½ GPH*, avoiding over-sizing, the biggest single cause of excessive fuel consumption. The Winkler nozzle won't clog because its fuel passage is approximately 30 times larger than the opening in a high pressure nozzle . . . virtually no service required. And it burns low grade fuel oils with amazing efficiency.

Sensational Demonstration!

The Winkler LP* Demonstrating Unit enables you to prove—*right in your own showroom*—the amazing efficiency of this burner. Burns crank case drainings—catalytic oils—oil and water mixture—unrefined crudes. All without smoke or soot.

Get back in the oil burner business *now*—replace worn and inefficient burners with the fuel-saving Winkler LP*.

THE WINKLER

Econo-Flame

A radically improved design in high pressure burners. Features the Deflecto-Air principle—producing correct oil-air pattern for complete combustion. This burner gives hi-pressure operation at its best.

WINKLER

Automatic Heating Equipment

U. S. MACHINE CORPORATION, Dept. AU-6, Lebanon, Indiana

NiAGARA

33
HEATING UNITS

GAS · COAL · OIL
...a line that enables you to meet ALL requirements ANYWHERE for residential heating

56
Years' Experience manufacturing residential heating equipment

...backed by a reputation for dependability that will bring you profits and prestige

Gas-Fired Series 20
Cast Iron
Gravity & A.C.

Gas-Fired Series 10
Steel
Gravity & A.C.

Gas-Fired Series 10
Upright
Steel—A.C. only

Oil-Fired
Series 30
A.C. only

Coal Fired Gravity
Cast Iron

Coal-Fired Gravity
Cast Iron or Steel

Package Blower available for A.C. Installation

Write for the complete Niagara story *Today*

NIAGARA FURNACE DIVISION • The Forest City Foundries Company • 2500 West 27th Street, Cleveland 13, Ohio

NiAGARA

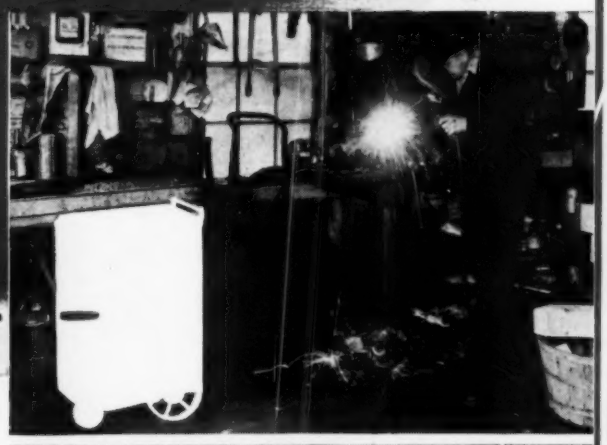
GRAVITY AND WINTER AIR CONDITIONING UNITS

WHICH FITS *your* PICTURE?

AC DOES IT FASTER, CHEAPER, BETTER 4 TIMES OUT OF 5!

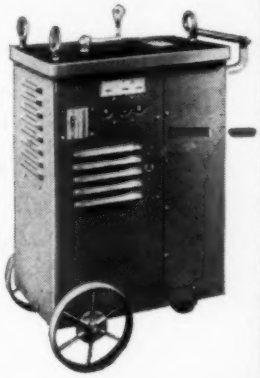
Are you losing time and money you could save if you had a small, inexpensive welder for those occasional odd jobs? Would a heavier welder for fabrication work help speed up production? Are you trying to adapt standard welders for tricky work on special alloys or thin sheet, when a welder built for the job would save you money?

If so, one or more of these Westinghouse shop welders can help you plug up holes where valuable time and money is being lost. For help in picking the best unit for your needs from these or from the larger Westinghouse industrial type welders, see your Westinghouse representative—today! Westinghouse Electric Corporation, P. O. Box 2025, Buffalo 5, N. Y. J-70493



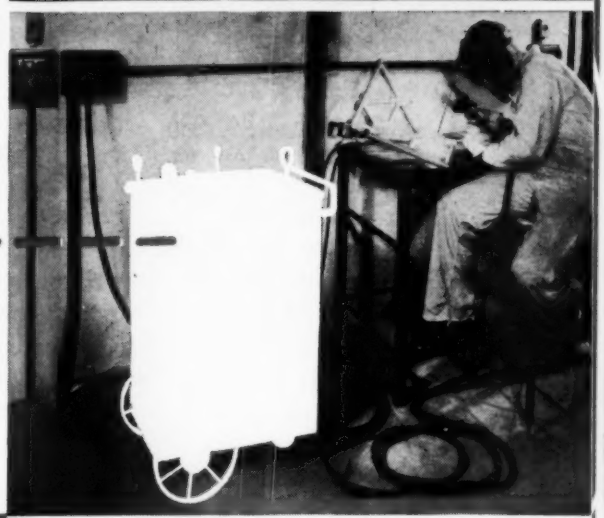
IF IT'S
- **Fabrication**
- **Light production welding**
- **All-round duty**

Get the sturdy, all-purpose Westinghouse WT-4 welder, designed for all-round service and light-duty production welding. 27 steps of current adjustment from 20 to 250 amperes; easily portable; cuts costs and speeds up work on all kinds of welding jobs.



IF IT'S
- **Thin sheet metal**
- **Special alloys**

Get the high-frequency-stabilized Westinghouse WC-AC aircraft welder. In wide usage for such work as thin-wall tubular fuselage members, tubular clusters on engine mounts, etc. Easy, stepless current adjustment from 10-200 amperes. Welds all types of alloys as easily as carbon steel. High efficiency and power factor.



WESTINGHOUSE

Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

EVERYTHING for Welding ANYTHING!

MAIL THIS COUPON FOR DETAILS

Send literature on welders checked:

☐ **WT-4**

☐ **WC-AC**

☐ **Industrial**

Name_____

Company_____

Address_____

"For the past 19 years we have found Penn Controls to be entirely satisfactory"

Mr. J.G. Brinkerhoff, owner of the Fuel Oil Service Co., in Waterloo, Iowa is an experienced dealer who's made his business a success by installing good heating systems with dependable controls. When he says, "Penn Controls are entirely satisfactory," he's speaking from the actual experience his company has had installing thousands on thousands of controls.

Try Penn controls in your business. You too will find them dependable as well as easy to install and service. For information about Penn Controls for all heating applications, ask your wholesaler or write **Penn Electric Switch Co., Goshen, Indiana.** Export Division: 13 E. 40th Street, New York 16, U. S. A. In Canada: Penn Controls, Ltd., Toronto, Ontario.

PENN

AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS

location. We are located on Cleveland's main thoroughfare just outside the higher rent district with plenty of traffic. We keep the showroom well lighted at night with spot lights on the Chrysler Airtemp seals and, of course, our neon lights are on until 1 o'clock every morning and then over the complete weekend.

"you help us build a lasting good business"

We are thankful to be associated with a manufacturer who supplies us with the products that make this a year-round business, so that we do not have the tremendous slumps that are always experienced by firms that are just in the heating or air conditioning business. The name Chrysler Corporation naturally draws people who are quality conscious. Backed by service, and installation, you help us build a lasting good business.

Very truly yours,

TEMPERATURE EQUIPMENT CORP.

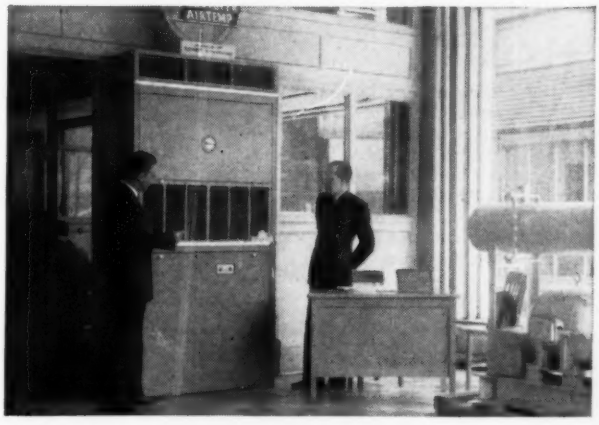
C. W. Millsom

C. W. Millsom
Vice President

Located on Euclid Avenue, Cleveland's main thoroughfare, the spacious Temperature Equipment Corp. showroom attracts plenty of traffic.

● Carl W. Millsom, Vice President of Temperature Equipment Corp., Cleveland, Ohio, also writes, "We are thankful to be associated with a manufacturer who supplies us with the products that make this a year-round business . . ." This fast-growing dealership, like many others in the Chrysler Airtemp organization, reaps extra profits from a broad line of precision-built heating, air conditioning and refrigeration equipment.

And Chrysler Airtemp can help you build a money-making 12-month business. Get the facts today on the "Basic 6" essentials to a profitable dealership. Mail the coupon now and see how Chrysler Airtemp gives you ALL 6!



The large, well-lighted showroom contains the broad line of Chrysler Airtemp heating, air conditioning and refrigeration products.

Chrysler Airtemp

AIR CONDITIONING
HEATING • COMMERCIAL REFRIGERATION

AIRTEMP DIVISION OF CHRYSLER CORPORATION
DAYTON 1, OHIO
In Canada: Therm-O-Rite Products, Ltd., Toronto

Get Details Now-Mail Today!

AIRTEMP DIVISION OF CHRYSLER CORPORATION
DAYTON 1, OHIO

Name_____
Address_____
Phone_____
Kind of business_____

Timely Tips on Stainless Steel Shop Practices

(No. 10 in a series)

HELIUM ARC WELDING

This process makes possible high welding speeds and good weld quality, particularly with thinner ENDURO sheets. The helium shield maintains high ductility in the weld. Use conventional dc motor-generator arc-welding units, with tungsten electrode. Argon is often used in place of helium since it is also an inert gas.

CLEANING

Many successful fabricators apply a solution of finely bolted whiting to ENDURO's polished surface after forming. The whiting is not wiped off until the work is ready for crating or shipping. This practice protects ENDURO during handling, and leaves a clean surface, free from fingermarks, loose dirt and grease.

SOLDERING

Proper fluxes are very important for solder adhesion. A number of excellent prepared fluxes for use with stainless steel are on the market. Their use is recommended highly. A second requirement for good soldering technique is that the soldering iron be large enough to retain sufficient heat to complete the work without reheating.

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Excess solder easily can be scraped from ENDURO surfaces, and so doing avoids the appearance of unsightly or crudely made joints. Use a stainless steel tool, so that no foreign metal possibly can become embedded in the surface. The stainless scraper should be somewhat softer, or of the same hardness, so that it will not tend to scratch ENDURO's polished surface.

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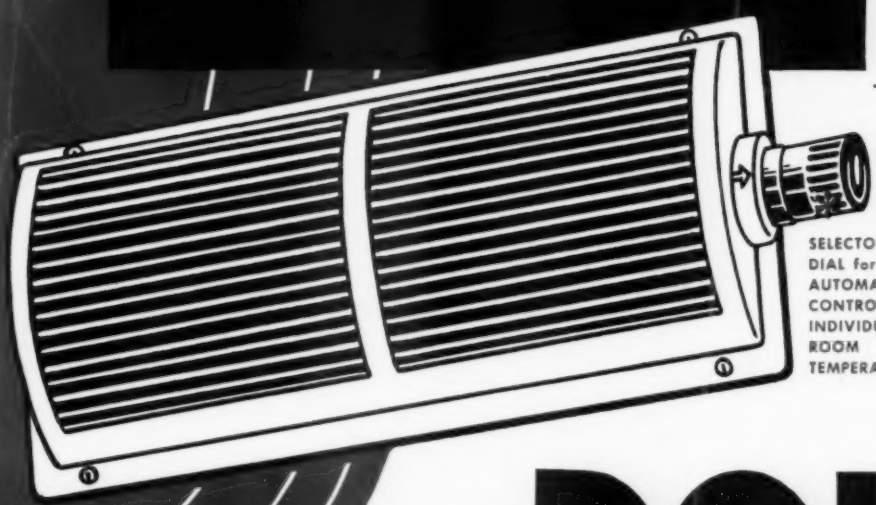

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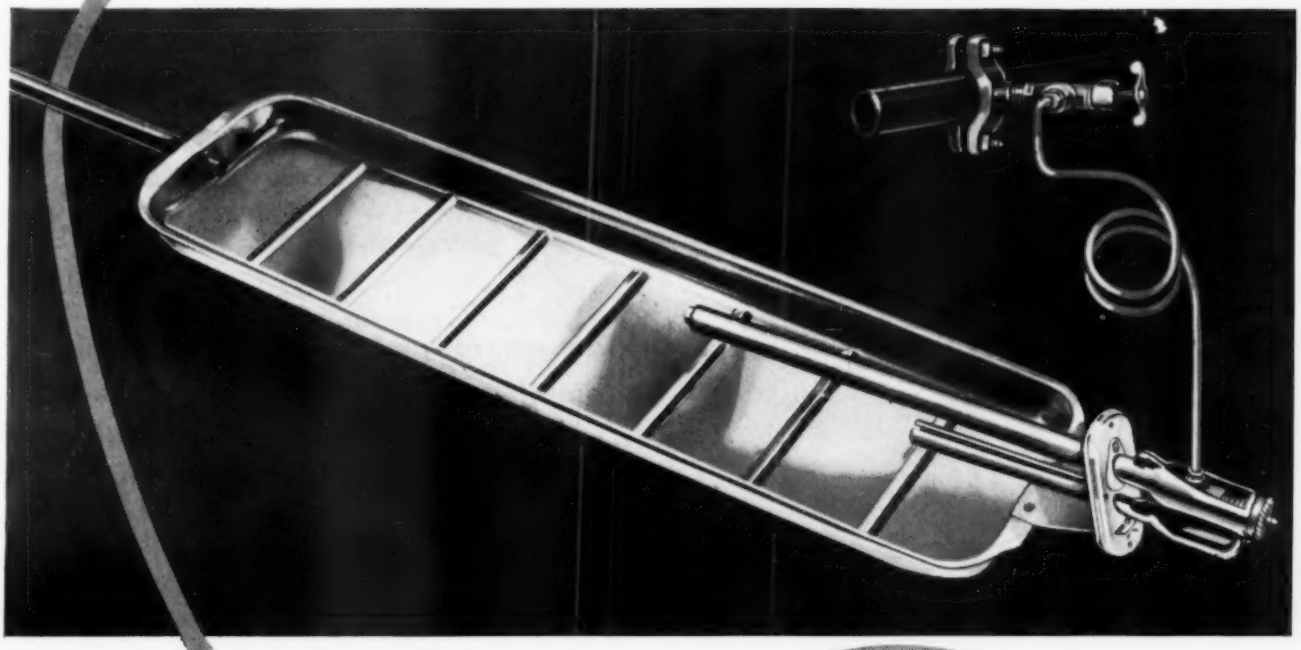

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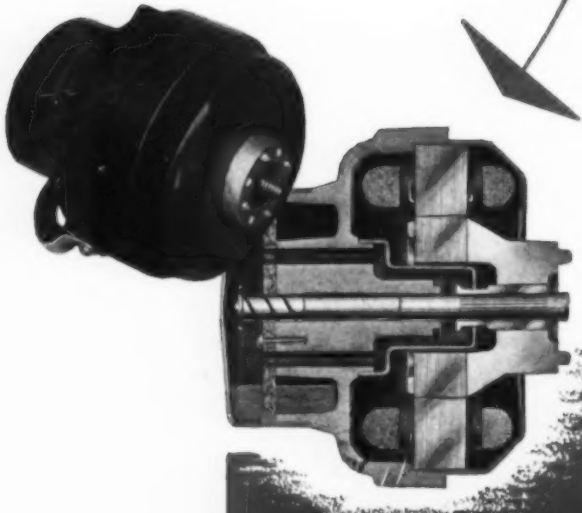

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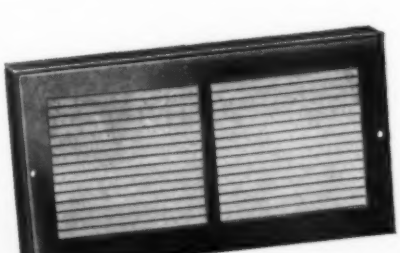
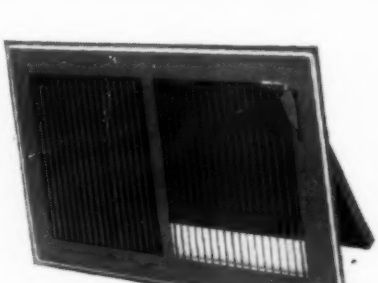


No. 27 Flange Intake

No. 60 Single Damper Vertical Fin Register



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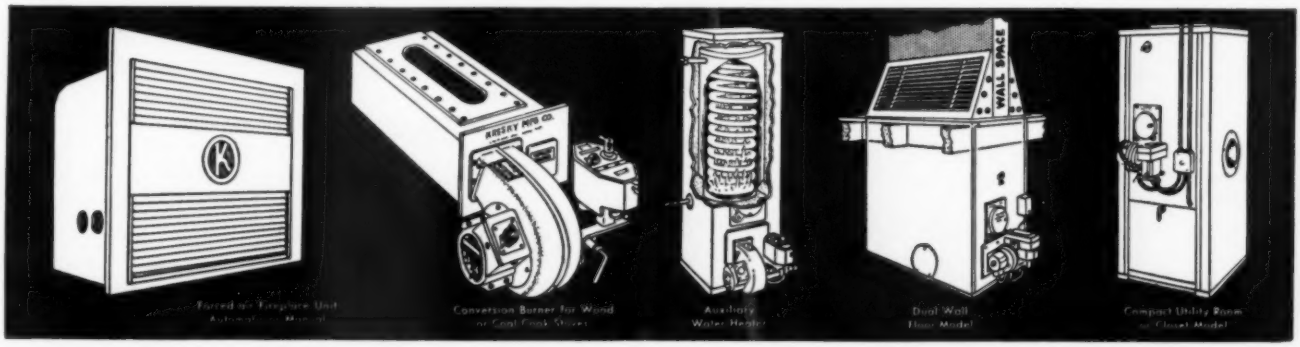

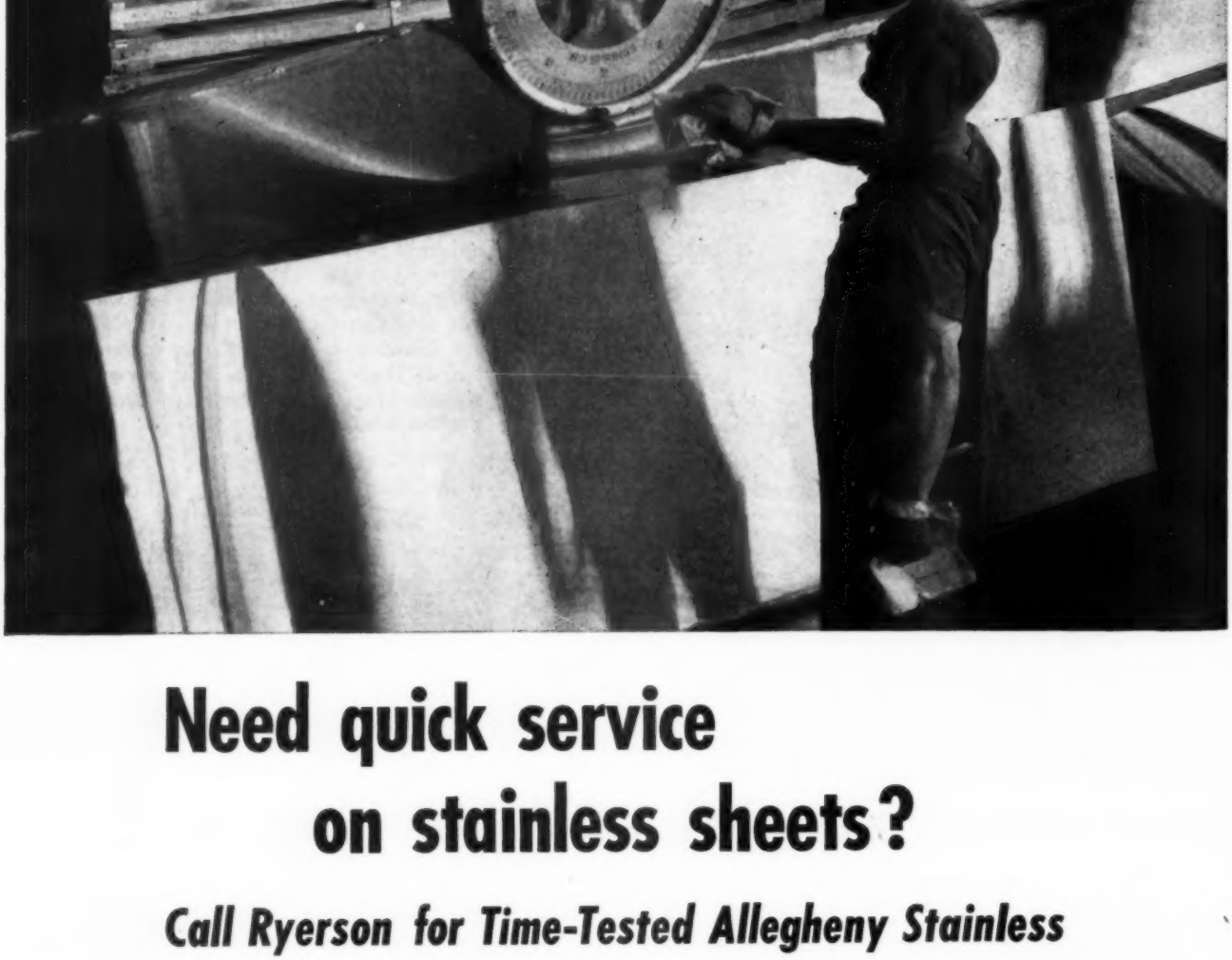

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AMERICAN ARTISAN

JURISDICTIONAL DISPUTES UNDER LMRA

JURISDICTIONAL disputes have been vexing problems and there have been many attempts in the past to set up plans under which they may be settled. The Building and Construction Trades Department of the American Federation of Labor was established mainly to do away with jurisdictional problems but its more powerful members have frequently refused to accept its decisions. Some have gone so far as to quit the department, and sometimes the AFL, and have forced the department and its jurisdictional disputes machinery to go through several reorganizations. The fear of the smaller unions that they would be outvoted by the larger led to an agreement in 1935 which provided for a referee to break deadlocks. In 1938 the referee resigned because he was defied by some unions; yet the department was able to settle many disputes without him and the number of strikes called to enforce jurisdictional claims fell off. During the war, strikes were forbidden by an agreement which, in covering war construction, covered almost all construction.

Prior to the present plan for settling jurisdictional disputes established under the Labor Management Relations Act, the president of BCTD decided cases which could not be settled locally. His decision was expected to dispose of the case, but not necessarily with respect to construction jobs not involved in the case before him. These were called "spot decisions" because they covered only the specific dispute. Conversely, jurisdictional decisions under LMRA will become national in scope and permanent. For this reason, it is necessary for our industry to claim work to which it is entitled.

The new labor law defines a jurisdictional dispute as "forcing or requiring any employer to assign particular work to employees in a particular labor organization or in particular trade, craft, or class rather than to employees in another labor organization or in another trade, craft, or class." Where a labor organization or its agents engage in such practices, the National Labor Relations Board is "empowered and directed to hear and determine the dispute out of which such unfair labor practice has arisen, unless, within 10 days after notice that such charge has been filed, the parties to such dispute submit to the Board satisfactory evidence that they have adjusted or agreed upon methods for the voluntary adjustment of the dispute." Thus jurisdictional disputes are under the jurisdiction of NLRB and subject also to voluntary settlement.

Early this year a voluntary plan providing for the establishment of a National Joint Board for the Settlement of Jurisdictional Disputes was ratified by the Associated General Contractors of America, Incorporated, national association of subcontractors, and the BCTD of the AFL. Establishment of the joint board was encouraged by NLRB and recommended by General Counsel Robert N. Denham who pointed to the advantages of the plan to employers, the unions, and the public. The alternative to a voluntary plan under which disputes are settled by the industry would be the establishment by NLRB of an organization in a field in which it has no experience.

The purpose of the joint board is to avoid the necessity of bringing jurisdictional cases before NLRB. And it is expected its decisions will carry great weight with NLRB in such cases as come before the latter because the new labor law gives NLRB final authority over jurisdictional disputes.

The National Joint Board for the Settlement of Jurisdictional Disputes is composed of an impartial chairman, two members selected by the BCTD of the AFL, two members selected by employers. One of the employer members represents general contractors, and the other represents subcontractors in the construction industry.

When a dispute come before the national joint board, the impartial chairman selects two representatives from labor and two representatives from employers. These are selected from a pool of 24 persons, twelve from employer associations and twelve from the BCTD. These men hear the cases and render a decision.

Requests for a decision in a jurisdictional dispute in the construction industry may be filed with the national joint board by an international union affiliated with BCTD of the AFL, a contractors association that has signed the agreement, and an individual contractor employing members of an affiliated international union by signing three copies of a stipulation agreeing to be bound by the terms and provisions of the agreement.

Arnold Kruckman's

BEFORE many weeks have passed the problem of the supply of aluminum for contractors and others (whose needs for sheet steel have not been met) will have been settled in a discussion between the manufacturers of aluminum and Chief Lindsay Howell, and his associates in the Buildings and Materials Section of the Office of Industry Cooperation. Chief Howell called the meeting for the latter part of September, and received the acceptances of the members of the aluminum-producing industry; but Mr. Lindsay was not very optimistic about a ready response to the needs of the sheet metal contractors on the part of the manufacturers. The government people are entirely sympathetic with the desire of users of sheet metal to shift over to aluminum for heating and exterior housing work—in fact for any use to which they might put aluminum. They realize better than many other people that steel is growing scarcer almost daily. It is not generally understood that approximately 40 per cent of the domestic steel production already goes to the various needs of national defense, and that 10 per cent more goes to those who support the production of the things needed for national defense. The same fact applies to aluminum.

Dwindling Aluminum Facilities

The puzzling phase is the apparent shrinkage of the facilities to produce aluminum which, in the classic words of Charles Wilson, then head of WPB, we had during the war in such volume that "it ran out of our ears." The government people say this extraordinary dwindling of supply and facilities is due to various reasons, not the least of which is the great expansion in the use of aluminum for many new products.

The list of things now made of aluminum, that formerly were produced from steel and other metals, is rather staggering. Also, the people in Europe who are cashing in on the ECA program apparently are making wide use of aluminum, most of which is shipped from Canada, and obviously must come in large quantities from the vast aluminum facility we set up across the border during the last years of the war, to the accompaniment of much criticism. The latest ECA report shows that apparently $74 million worth of nonferrous metals have been shipped to the ECA customers in Europe, all of which, except a small portion, is aluminum. Virtually all the aluminum was shipped out of Canada. It is interesting to note that Denmark received $513,000 worth of aluminum ingots from the Canadian source, in one shipment, while at another time it received a shipment valued at $256,215. Greece also was the recipient of a quantity of aluminum ingots from Canada, paid for with American ECA dollars; and the Netherlands was provided with more than $250,000 worth of ingots, also from Canada. Do not be surprised if there is a large increase in the volume and value of the materials, such as aluminum, shipped during the next months to ECA Europe and ECA China. The fact is not reflected in the publicity or public discussions of those who represent ECA, but it is generally known here that the distribution of the $6 billion in grants, goods, and loans, is not going forward as rapidly as the gods in the ECA machine wish. The total distributed to all countries by the middle of September was less than $1,500,000,000. The goal has been to get the entire $6 billion working Over There by the end of December. Eighty per cent of the funds are to be scattered around in grants and gifts; 20 per cent in loans.

Rehabilitation of European Industries

The Europeans are not particularly averse to taking the money, but they do not like even the mild conditions imposed with the money under existing circumstances. It is generally understood in Washington the Europeans are quite suspicious of our presumed purposes; they do not welcome any efforts we may put forth to stabilize their very shaky currencies; and, by and large, they are striving to get the ECA dollars without any strings attached, so they may spend them for the very political purposes which our Congress said must be avoided. It probably will be very interesting to learn that a large part of the Europe still open to us, even in the free distribution of dollars, is not so eager to establish industries locally which may be competitive with industries in a neighboring country. There is even a greater opposition prevalent to competitive imports than there is in this country. For this reason many of the countries, among whom our ECA blessings are supposed to flow, are very lukewarm to some new industries. They do not want the products of those rejuvenated industries to come across the borders from their neighbors. They think there may not in consequence be a market for the products of their own potential industries among their neighbors. The rehabilitation of European industries is not the happy business that some of our people have rosily pictured it.

Another difficulty in the operation of ECA is reported to be the lack of unity in the ECA itself, in the high brass regions. They tell us here that W. Averill Harriman, never very famous for intellectual brilliance,

Washington Letter

wants Hoffman's job, sees no good reason for the existence of the two, and is not exactly supporting the Hoffman program with full enthusiasm. Inevitably we have one of those tugs of war between Paris-London and Washington, not unknown in the experience of bureaucratic history. We heard of one man, a businessman of fine caliber and accomplishments, who took one of the European ECA jobs and went over, fired with a very sincere ambition to do an unselfish contribution to the restoration of the world's economic and social health. The other day a friend received a letter from him in which he complained bitterly that he had been sitting in his London and Paris offices for at least two months, twiddling his thumbs doing absolutely nothing. It is the opinion here that the ECA problem, administratively, will not be cleared until the issues between the Hoffman faction and the Harriman faction are settled.

Electric Power Too Costly

Another reason there is a scarcity of aluminum is the lack of electric power at rates which make the power useful from an economic standpoint. Huge quantities of power are used in the production of aluminum, and the cost of the power must be reasonable in order to produce commercial aluminum. Cost was secondary during the war years. The production under war conditions totalled roughly about 2,500,000,000 pounds per annum. Present commercial production runs at the rate of 1,250,000,000 pounds. Something like 750,000,000 pounds of producing facilities are now too costly, while the rest, for various reasons, are not usable. There are some good facilities in the Far West, and there is presumably abundant waterpower in the Far West, especially in the Pacific Northwest. The hitch out there is that there are so many industries now built upon the waterpower that there is not enough power to go around, and the aluminum plants are among the industries which are unable to operate at full capacity. Finally, there is the immediate prospect that the needs for national defense will be stepped up more than double the present requirements.

Military Spending

The National Military Establishment, the new giant unit of Government, which is the consolidation of all the armed services, is now actively engaged in spending the $17 billion which the recent Congress supplied earlier this year. It is expected the Congress will come back after the November elections, no matter who is elected, in order to make more appropriations. It is true that the President has told the armed services they must confine their prospective national defense spending within the limits of $15 billion, an additional sum to the $17 billion which they are presently disbursing; but it is the opinion here that when the Congress makes the next appropriation, either in November-December, or in January, that the sum will be $20 billion.

Stockpiling of Metals

Aluminum, as well as steel, will be among the primary fundamental materials used in developing this new program. Stockpiling already has been stepped up, and will increase to the tune of $750 million for the period ending next June. Aluminum, copper, lead, manganese, tin, and zinc, are at the top of the list of the metals to be purchased. The National Military Establishment recently announced that there will be a total of 1,581,000 men in all the armed services by January 1, 1949; and that the number will increase to 1,786,500 by July 1, 1949. In July, the Army is expected to have 790,000 men; the Navy, 460,000; and the Air Force, 444,500. The major expenditures of the Army will be for more housing and more camps. The Air Force will build more facilities for its planes and for its experiments. The Navy needs more housing, and more plants for its shore work. All this means business for the people who make warm air furnaces, and who install furnaces, ducts, piping, gutters, and other sheet metal products used in housing and structures, as well as other types of sheet metal products. Housing is one of the four general classifications for which the armed services may require *mandatory* allocations.

Voluntary Allocation Possible

As the result of the visit here of the trade relations committee of the Sheet Metal Contractors' National Association it seems very likely that some arrangement will be made by which those who use sheets of various types will be able to obtain stated quantities by voluntary allocation. It is doubtful, however, the system will be in operation before the first quarter of 1949. This expected result is the consequence of the joint efforts of the Senate ... ll Business Committee, headed by Senator Kenneth Wherry, and actively directed by George F. Meredith, and the office of Industry Cooperation. The committee transacted its business with Miss Katherine Guyon during its visit to the Senate Small Business Committee.

Whatever allocation is fixed will be an additional quantity to that already given the 450 warm air furnace manufacturers. It will be remembered this group has been the recipient of a total of 29,500 tons of steel per

(Please turn to page 138)

Understand Your Overhead

ARTHUR ROBERTS
Pompton Lakes, N. J.

"HOW do I know how much overhead to charge each customer? Would I total my overhead for the year and then divide it into weeks to get the amount I should clear each week for overhead or what? Last year I don't believe I cleared enough to cover the cost of running my business and I certainly would appreciate any pointers you can give me."

This query, which came to me, is typical of the muddled conception of overhead among members of this industry, particularly the small and moderately-sized operators, and we shall try to bare its vitals in this article so that the reader may get a clear understanding of the application of overhead expense to job estimates and costs.

To estimate overhead accurately, one must know how much is spent for overhead, and this information should be in the financial accounts, which record income and outgo. The contractor whose query opened this article states that he did not believe he cleared enough to make a profit and this admission indicates that his books are in bad shape because, if accurately recorded, his figures would have told him whether he lost money or made a profit. If you are in the same boat, take steps to assure the accuracy of your financial accounts, otherwise, your estimates or recorded job costs will be wrong even though you use the proper costing procedure.

Overhead expense includes depreciation, heat, light, power, office salaries and expense, telephone, insurance, rent or ownership expense, etc. In other words, all outlay except labor and materials used on a job is overhead, but this outlay cannot be alloted to each job with the same precise calculation possible with labor and materials, because it is paid on the basis of over-all operation, not on the basis of the job.

When you have determined accurately what your overhead was for a prior period, usually 6 months or a year, break it down to the monthly average. Say it is $500 a month. Now, how are you going to apportion this expense to an estimate so that the customer is charged an equitable share of the burden? This is the part that confuses a lot of dealers and contractors in this industry because they do not realize that there are three ways to allocate overhead to repairs and installations and that all have weak spots that must be watched to avoid loss. The following easy-to-understand tables should clarify the subject better than lengthy verbal explanation.

The Overhead-Ratio-to-Sales Formula

Say that your profit and loss statement for a prior period revealed the following figures:

Sales	$20,000	100 per cent
Labor and materials	12,000	60 per cent
Margin on sales	$ 8,000	40 per cent
Overhead expense	6,000	30 per cent
Net profit on sales	$ 2,000	10 per cent

Using this formula, the dealer or contractor would apply the same overhead ratio to sales (30 per cent to each job he estimates during a subsequent period. Say that he figures labor and materials at $60. This would be his complete estimate.

Labor and materials	$ 60	60 per cent
Overhead expense	30	30 per cent
Net profit	10	10 per cent
Selling price	$100	100 per cent

These are the same ratios as shown on his prior profit and loss statement, and so, the customer would be charged his share of overhead expense. But, here's the catch in this formula, a weakness that few members of this industry realize and one which often brings a mysterious loss or reduction in anticipated net profit. If sales deviate from the prior period, are higher or lower, the overhead charged will be at variance with the anticipated result, consequently, those using this formula must watch sales volume month-to-month and try to keep it up to prior-period sales. If the dealer or contractor can increase the volume, he need not worry because this will mean more profit. If his volume is less, he will make less profit, may experience a loss, even though he uses the right overhead ratio revealed by his books that are kept accurately.

The Mark-Up on Cost Formula

Using this method, the estimator uses the cost of labor and materials as the basis of calculation and adds a certain percentage for overhead, the ratio taken from his book figures. If labor and materials total $12,000 and overhead $6,000 for a prior period, the ratio of overhead to labor and materials cost is 50 per cent, and so, the estimator adds 50 per cent to this prime cost for overhead on all jobs; to wit:

Labor and materials—(prime cost)	$120
Overhead—(50 per cent of prime cost)	60
Over-all cost to which profit is added	$180

This formula provides a means of charging a fair

proportion of overhead to each job estimated only as long as the cost of labor and materials remains the same as it was in the prior period. If this cost goes up or down, the overhead figured on the estimates will go up or down, although the actual outlay for overhead expense is not influenced by the fluctuation in labor and materials cost. While the cost of labor and materials is on the upgrade, the estimator using the foregoing formula need not worry unless it drives business to a competitor because his job prices are too high.

But, should the prices recede, this formula will work to his disadvantage, and so, he should be on guard. At best, this formula is safe only when the cost of labor and materials is fairly well fixed over a long-term period. We haven't had such a condition for many years and may not experience it for many years to come. Cost accountants, because of the economic instability that is plaguing us and the resulting price variations, advise discontinuance of this formula. We suggest that those using it consider this counsel.

The Overhead Labor-Hour Formula

A dealer or contractor who employs two mechanics working 8 hours daily pays for 4,800 hours yearly on the basis of 300 working days a year, or 400 labor-hours a month. If his overhead is $500 a month, the overhead chargeable to each labor-hour is $1.25, and so, the burden is charged to the customer on the basis of the number of hours put in on a job: to wit:

Materials	$50.00
Labor—(15 hours at $2)	30.00
	$80.00
Overhead expense—(15 labor hours at $1.25 per hour)	$18.75
Over-all cost to which profit is added	$98.75

Time Charge Is Constant

Many accountants claim that this is the best method to use in this industry because overhead expense increases with time and time never changes. Sixty minutes always make an hour. In this it differs from the overhead on sales volume or mark-up on cost formulas because sales volume and prime cost may change in a subsequent period. Then too, most items under overhead expense are purchased on a time basis: insurance is bought by the year, property taxes are paid by the year, depreciation is computed on a year's basis, rent is paid by the month, mortgage interest by the year, etc. However, this formula also has a weak spot. The men must work as many productive hours in the current period as they did in the prior period. If they work fewer hours, you won't get back all your overhead during the current period. If you can get more productive hours out of them and charge your customers on the basis of prior period labor-hour figures, you will increase your profit but, of course, competition will prevent you from getting too much excess profit. Nonproductive time is the thing to watch when using this formula, time lost waiting for materials on jobs, soldiering, too long a wait between jobs, too much time spent cleaning up the shop, etc. To keep non-productive time at minimum, the management must effect

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Industry's Growing Interest In Retirement Plans

EARL O. SHREVE
President, Chamber of Commerce of the United States, Washington, D. C.

THE Chamber of Commerce of the United States has been sponsoring a series of local and regional meetings, in conjunction with local chambers of commerce, for the purpose of bringing to employers more detailed first-hand knowledge about employe pension and profit-sharing plans. The plan has been to bring these meetings a group of speakers, each of whom has specialized on various phases of these plans. Speakers have included pension consultants and actuaries, tax attorneys, life underwriters, trust officers and executives of industrial corporations with long experience in the operation of pension plans.

Conferences have been held in Philadelphia, St. Paul, Indianapolis, St. Louis and Omaha and others may be held.

In spite of the large amount of literature which has been written on the subject of pension and profit-sharing plans, these conferences have shown that employers have a great deal of interest in getting first-hand knowledge from impartial sources on some of the problems which are confronting them. It has been found that many corporation executives, who already have plans, have as great, if not greater, interest in attending these conferences and asking questions, as do those who have no plans.

Early Start Made

As long ago as 1932 a special committee of the chamber made quite a thorough study of this whole subject and reported to the board of directors. The board adopted a resolution which read:

"That employers individually and collectively should themselves provide adequate reserves for unemployment and other benefits for their employes has already been declared by the chamber. Information is being given to employers in all parts of the country about

*Reprinted from the Journal of Commerce, New York.

the manner in which they can proceed.

"Provision for retirement of superannuated employes is now recommended by a committee of the chamber, the report of which is before this meeting. We ask of all employers thoughtful consideration of this report, and suitable action upon its recommendations.

"Retirement for superannuated employes of long service on annuities is an aid to the profitable administration of business enterprises. The advantages to employers, to employes, and to the public are obvious. Adoption of a definite retirement annuity plan should accordingly be given mature consideration by the management of every enterprise which has, or is likely to have, employes of long service. For all funds set aside to cover liabilities under a retirement plan suitable safeguards should be provided. A progressive step toward assuring the benefits of employe retirement annuities permits employes whose connection with an employer is terminated after a reasonable period of service to retain their annuity credits, as a help toward provision for their old age."

There are few more painful talks for a supervisor than the one of telling an employee who has rendered long service that he is going to be removed from the pay roll. Correspondingly, there are few emotions in life that are more distressing than the dawning realization that there is no longer the co-ordination of hand and brain that has earned a living through the years. Few of us are willing to admit, even to ourselves, that we have passed the peak of our physical and mental prowess. That seems to be just as true among those who have been doing repetitive work, as it is among the managerial group.

The very fact that the employer who knows the employe best has reached such a decision, means to the employe that there is little or no chance of convincing some other employer that he should be hired for a comparable job.

Instead of facing the program previously outlined with each employe as he reaches that indefinite time in life known as old age, it is obviously desirable to have an established program that is well-known to each employe, that provides an income after the weekly or monthly pay check ceases, and that permits the supervisor to say to the employe, "I am glad that you are retiring while you are in good health and can enjoy the free time and income that are being provided under our Pension Plan. Under these circumstances, the employe has achieved the ultimate goal—being paid for not working, and with benefits continued as long as he lives!

Fixed Retirement Age

To secure maximum advantage in peace of mind for the supervisor and of self-respect by the employe, pension plans have increasingly recognized the importance of having a fixed retirement age. This has made it possible for the individual to lay his personal plans concerning the purchase and payment for his home on a systematic basis and to know long in advance that at the time he reaches the specified age he will become a gentleman of leisure with a fixed income.

It has been argued that a fixed retirement age results in the employer, and the economy of the country as a whole, losing the services of some employes who are still able to produce at substantially their maximum capacity. This is undoubtedly true of many employes who reach the specified age, but is a small price to pay for the self-respect which automatic retirement confers upon all of those who retire in accordance with such an established program.

From the standpoint of the employer there are many advantages to be gained from an adequate and properly conducted retirement program. Not the least of these is improved employe morale and increased loyalty which can be developed by recognizing the employe's wants and supplying them to the most practical extent. Experience has shown that two of these wants are security and adequate compensation.

How important those loom in their thinking, and incidentally in the thinking of the general public, is demonstrated in a survey made recently by Dr. Claude Robinson of the Opinion Research Corp. That study was made to determine what factors affected the reputation of a company in its community, and the survey was made, not only among the employes, but among the general public as well. Six cities were selected and in each about a dozen companies were chosen for the test. The questions asked were, "Which company do you think is the best in the community and why?" One could readily jump to the conclusion that the answer, "They pay the most money," would rank as reason number one, but that is far from correct. Other considerations outranked rates of pay two to one; among those given most often were those referring to security, such as low cost insurance and pensions. The companies which provided such facilities were given the highest ratings, and, in many cases, the companies whose declared policy was to pay high rates but stop with that, were frequently at the bottom of the list.

So it is evident that, while those who feel that their responsibility is discharged with the payment of generous rates may enjoy a feeling of righteousness, they are almost alone in their satisfaction. This then points to another dividend of a sound industrial relations program—a reputation for a social consciousness that redounds to the benefit of the commercial activities of the company as well.

Natural Development

The pension plan movement in this country has grown to such an extent that it can no longer be considered as a device to distribute profits to employes instead of paying the greater portion as income taxes. The number of plans is constantly increasing and the movement must now be regarded as a natural development in the social and economic life of this nation. The end of the war has not resulted in any wholesale scrapping of pension plans. I believe that the reverse is true, and that many of the companies that adopted a hastily conceived plan during the war will take steps to revamp and smooth out their plans, and many new plans are being adopted.

Practically speaking, a pension plan is partly or wholly a gift from management. Broadly speaking, it is much more than that, in that it is tacit recognition by management that those who work for a company will be better workmen if their futures are reasonably secure.

AGREEMENT

The creditor is not liable for any of the corporation's disbursements incidental to collection.

50% on the first $100.00 recovered or on claims settled through the assistance of Magistrates, Attorneys or our Legal System or on installment collections.

25% on all other collections.

Commission is charged on all accounts collected, settled satisfactorily, withdrawn or ordered dropped during process of adjustment.

The minimum charge is fifty cents on each account to be deducted from any money recovered under this agreement.

All commissions are due and payable on the day payments or settlements are made.

Failure to furnish necessary evidence of indebtedness upon request will be considered instructions to drop.

No agent has authority to alter this agreement, verbally or in writing, nor to make any verbal or written agreement relative to terms of agreement or modes of collecting or to receive or receipt for any money from debtors or clients.

Claims not in process of adjustment released in six months upon request.

Crooked Collection Agencies

How They Work

DALTON D. SELTZ
New York, N. Y.

EVERY year hundreds of dealers in warm air heating and sheet metal as well as other industries throughout the country are mulcted of thousands of dollars through the fraudulent practices of certain types of "long distance" collection agencies—located perhaps 1,000 miles from the merchant—whose salesmen go from town to town soliciting their delinquent accounts.

Today especially, this type of agency finds easy pickings among these dealers, many of whom have noticed alarming increases in their uncollected accounts during the past few years—often totalling thousands of dollars. Their own attempts to collect were usually confined to a few polite reminder letters, since they didn't care to offend their customers. Hence they are receptive to a plan that promises quick collection of their accounts with no obligation to themselves.

Just what happens when the agency gets its clutches on the accounts is shown by the example of one of these dealers, whom we shall name Mr. Bolton, who succumbed to the salesman's smooth spiel and turned over 84 accounts for collection, totaling $1600. In about 4 months, he received a statement from the agency that read something like this:

PAYABLE TO CLIENT

Collections made on 8 accounts.....$426.00

PAYABLE TO AGENCY

50 per cent commission (for installment and attorney collection) on the $426 collected by agency $213.00

25 per cent commission on 7 accounts, totaling $660, considered "dropped" because of failure of client to submit original notes and itemized statements on request 165.00

$2.00 minimum charge on 26 accounts, as provided in contract 52.00

Total Payable to Client.....$426.00

Total Payable to Agency..... 430.00

Net due agency.... $4.00

Hence an ironical situation! The agency collected the substantial sum of $426.00 on Mr. Bolton's accounts, yet he not only doesn't receive a cent in return but he actually owes the agency money!

The collection agency's salesman comes equipped with a great deal of documentary data—most of it fictitious—which he shows to the dealer in support of his claims. These include a list of past customers that contain many impressive nationally known names. Also included are testimonial letters and magazine and newspaper clippings—all praising the courteous, effective service performed by the agency.

For good measure the salesman may also show an impressive looking "dealers' magazine", its contents devoted almost exclusively to extolling the merits of the collection agency. The dealer, in thumbing through it, doesn't realize that this magazine consists of *one* issue only—and was anonymously published by the agency itself.

INVESTIGATIONS MADE THROUGH BANKS EMPLOYERS, ETC.

BONDED ATTORNEYS AND PROFESSIONAL COLLECTORS THROUGHOUT THE WORLD.

IT COSTS LESS TO PAY HONEST DEBTS THAN TO BEAT THEM. IGNORANCE OF THE LAW IS NO EXCUSE.

WE GARNISHEE SALARIES AND WAGES. WE EXECUTE JUDGMENTS. WE FORCE THE DEBTOR INTO COURT ON SUPPLEMENTARY PROCEEDINGS.

WE ADVERTISE ACCOUNTS AND JUDGMENTS FOR SALE IN LOCAL NEWSPAPERS.

WE REPORT CREDIT STANDING OF INDIVIDUALS TO MERCHANTS AND PROFESSIONAL MEN IN GENERAL.

THE MAN THAT PAYS HIS HONEST DEBTS CAN FACE THE WORLD WITH A SMILE.

RECORD

Audit No. .....
.....
vs. .....
Amount Claimed $.....
Date Sheriff's Notice.....
Date Serving Writ.....
Court .....
Court Docket Page.....
Name of Court Judge.....

Dear Sir:

Your account has been assigned to us for immediate action and it was very unwise on your part to ignore our notice for payment of this obligation. Final papers are being prepared for the CHIEF ADJUSTER of our LEGAL DEPARTMENT for immediate action.

The _____ is organized to protect creditors from people who attempt to evade payment of their just obligations, or defraud their creditors. If necessary, the full LEGALIZED POWER of this organization will be brought to bear on your case.

You have had every opportunity to pay this account in the past and we cannot permit any further delinquency on your part. We have guaranteed to COLLECT OR PROSECUTE this account; therefore it will be to your advantage to adjust this matter amicably.

You cannot afford to disregard this letter and unless we hear from you within a few days with a check or money order, DRASTIC ACTION WILL FOLLOW.

Yours very truly,

Here is a sample of the type of collection letter written by the agencies discussed. Note the threatening aspect of the "record" in the upper right-hand corner.

"How much does this service cost me?" Mr. Bolton asked.

"Nothing at all—unless we actually collect on your accounts," the salesman replied. "And then, it's only 25 per cent commission."

"That sounds fair enough," Mr. Bolton said. "But I don't see how you can collect without antagonizing my customers. After all, your firm is located hundreds of miles from here. I don't want you to send them a bunch of threatening letters."

The salesman smiled tolerantly. "You misunderstand," he stated. "We absolutely don't work through letters. It is all *personal contact*."

He then proceeded to explain that the home office merely functioned in a supervisory capacity; that, however, a trained crew of adjustors would be sent into Mr. Bolton's locality and kept there for 60 days. These men would consult with Mr. Bolton each week and inform him of their progress with his accounts. Thus all negotiations would be "localized" and "individualized."

"In fact," the salesman continued, "our adjustors will become your good-will emissaries, actually stimulating trade for your store! The financial condition of each debtor is discussed with him in a friendly manner. If he can't pay in full a budget plan, enabling him to pay a small amount each week, is arranged. And, if he can put up some kind of security, we will finance his account and pay you immediately in cash."

Mr. Bolton was still cautious. "Do I have to sign a contract," he asked. "And how do I know that you'll refund the money that you collect from my accounts."

"First," the salesman answered, "debtors are specifically told to pay directly to you. In rare cases where we receive payment we quickly turn it over to you. Second," he added, "here is our Fidelity Bond which warrants that all losses will be made good." He exhibited a beautifully embossed certificate from a fidelity company, guaranteeing all "legitimate losses" incurred through dealing with the agency.

"Third," he continued, "you need sign no contract whatsoever, and your accounts are returned to you anytime you ask for them."

Mr. Bolton didn't see how he could lose. It looked like the agency was taking all the risk. He produced his ledgers and they went over his accounts, the salesman jotting down names and amounts of delinquent debtors. Perchance Mr. Bolton was called away two or three times during the interview. Frequently the salesman will grasp this opportunity to jot down other names on the books not intended for him. He gets paid by the account, and his agency condones this practice because current accounts like these pay up on first demand.

"Please sign this list," the salesman requested when he had finished copying the names. "Your signature verifies the correctness of the accounts." Mr. Bolton

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NEWS SUMMARY OF THE MONTH

Steel Shipments and Production Up

AMERICAN IRON AND STEEL INSTITUTE has released figures on shipments of finished steel products and production of ingots and steel for castings. Finished steel shipments in the first seven months of 1948 were more than 1,300,000 tons higher than in the corresponding period in 1947. Shipments of cold rolled steel sheets set a monthly record in July at 583,417 net tons, bringing the total for the first seven months of 1948 to 3,868,500 tons, 23 per cent higher than in the first seven months of 1947.

This gain in cold rolled sheets, which are used in the making of automobiles and various other kinds of consumer goods, was one of the major changes in the increase of total shipments, which stood at 37,486,000 tons during the first seven months of 1948, compared with 36,165,000 tons in the identical part of 1947.

In eight months of 1948, steel production totaled more than 57,500,000 tons of ingots and steel for castings, a new record for peacetime production. That amount of steel was approximately 1,645,000 tons larger than in the first eight months of 1947. It exceeded the total output of the entire year of 1939 or any other year in the 1930's. If production is maintained at the rate of the last four months, it is likely that total production for 1948 will be about 87,000,000 tons, a peacetime record.

New Advisory Committee

OFFICE OF INDUSTRY COOPERATION has announced the appointment of an advisory committee and a task committee for the rain-carrying equipment industry to consult with the OIC on steel requirements under provisions of the Voluntary Agreements program. Rain-carrying equipment consists of eaves trough, downspouts, formed gutters and formed valleys, including necessary fittings and accessories. Preliminary meetings have been held on the subject.

The Scrap Problem

SECRETARY OF COMMERCE CHARLES SAWYER has made two moves aimed at relieving the critical shortage of iron and steel scrap. He announced that the Office of Industry Cooperation is considering the feasibility of establishing a private corporation to act as the exclusive agent in Germany for the purchase of German indigenous scrap for export to the United States. This plan would take the form of voluntary action under Public Law 395 and would entail the appointment of an industry advisory committee for the scrap industry. Scrap brought to this country would be allocated to consumers by the OIC on the basis of relative need.

The other part of the program was a meeting with leading executives of all trade associations representing industries using iron or steel to formulate plans for a gigantic scrap drive to help the situation until foreign sources can be lined up.

Wisconsin Celebrates Birthday

WISCONSIN INDUSTRY told the story of free enterprise to more than 1,500,000 Americans during the month of August—told it in displays, panoramas and other visual presentations of the fruits of the free enterprise system.

Milwaukee's state fair park was the scene of this half-million dollar effort in which more than 500 firms participated, and the occasion was the month long celebration of the state's 100th birthday.

Visitors were told exactly how many people were employed in Wisconsin industry, how industry's taxes went to build public roads, conserve natural resources, construct public buildings, parks and beaches, provide hospitals, schools and state institutions.

Cash Awards for Sheet Metal Apprentices

A NATIONWIDE CONTEST featuring awards for skill acquired under apprentice training has been announced by the Ventilating and Air Conditioning Contractors Association of Chicago. Every sheet metal apprentice in the United States is eligible to compete for cash awards of $50, $75, and $100. The awards will be made about May 1, 1949, at the annual convention of the Sheet Metal Contractors' National Association in Washington, D. C.

Apprentice employees of firms in the Chicago area will not be eligible for the national awards but will participate in a separate local competition also sponsored by the Chicago association.

A V&ACCA trophy will be awarded to one of the Joint Apprenticeship Committees for outstanding performance in apprentice training.

Application and registration for the awards should be made either by the individual apprentice or by the local Joint Apprenticeship Committee as soon as possible to insure ample time for action by the National Award Committee.

Full details may be obtained from the National Award Committee, Room 1120, 228 North LaSalle Street, Chicago 1, Illinois.

Exposition to Be in Chicago

IT HAS BEEN FORMALLY ANNOUNCED that the 9th International Heating & Ventilating Exposition will be held at the International Amphitheatre in Chicago next January 24-28. According to present information it is to be the largest show of its kind with more space for exhibition purposes than at any previous exposition.

As in the past the exposition is sponsored by the American Society of Heating & Ventilating Engineers and will run concurrently with the 55th annual meeting of the Society. Displays are devoted to equipment for the heating, ventilating and air conditioning of industrial, commercial and domestic establishments. The exposition is under the management of the International Exposition Company, Grand Central Palace, New York City. Charles F. Roth is manager and E. K. Stevens associate manager.

NWAH&ACA Bulletin

THE NATIONAL WARM AIR HEATING & Air Conditioning Association has sent out a bulletin to its manufacturer members in regard to the operation of the steel allocation program for warm air heating equipment. George Boeddener, managing director, has advised manufacturers who have been having difficulty getting the steel they are supposed to get, to write to Lindsay Howell, acting chief, Building Materials Negotiating Division, Office of Industry Cooperation, U. S. Department of Commerce, Washington. He advises giving Mr. Howell the full history of efforts to obtain steel under the allocation program and perhaps if sufficient pressure is put on something will be done to expedite deliveries. If pig iron is the product that the manufacturer is unable to obtain he should write to G. R. Meade of the same office in Washington.

Heating Wholesalers Meeting

PLANS HAVE BEEN COMPLETED for the next annual Convention and Membership Meeting of the National Heating Wholesalers' Association, scheduled for the Blackstone Hotel, Chicago, Tuesday, January 25th, 1949. This meeting will coincide with the 9th International Heating and Ventilating Exposition and the convention of the American Society of Heating & Ventilating Engineers (January 24-28).

R. M. Colegrove, executive secretary of the association, has announced that the program will include talks on "The Business Outlook for 1949", "Can the Wholesaler Survive in Our Future Economy?", "Distribution—A Study of Methods and Means in This Heating Trade", and many other subjects of vital importance.

Wicklein Succeeds Close

LOUIS M. WICKLEIN has succeeded the late James W. Close as general secretary-treasurer of the Sheet Metal Workers International Association. Mr. Wicklein has been first general vice president and an international officer since 1917. He started in the sheet metal trade in St. Louis and is a native of Du Quoin, Illinois. As general secretary-treasurer he also takes over the post of editor of the Sheet Metal Workers Journal.

Steel for Tanks

OIL-HEAT INSTITUTE OF AMERICA has had a steel supply committee working on the problem of securing additional steel for the production of fuel oil storage tanks. A recent bulletin sent out by A. E. Hess, managing director of OHI, indicates that the efforts of the committee may be successful. Mr. Hess says:

"We are now advised by Commerce that as a result of our efforts and the September 14th meeting, the question of allocating fifteen to twenty thousand tons of steel per month for the production of fuel oil storage tanks has been been cleared to the 'Senior Committee' for final decision. Our further information is that matters cleared to the 'Senior Committee' have good chance of final approval and 'implementation' with steel promptly 'borrowed from other allocations.'

Housing Starts Decline

HOUSING STARTS DROPPED in the month of August, when builders started 83,000 new nonfarm dwelling units, according to preliminary estimates of the Bureau of Labor Statistics, U. S. Department of Labor. This was a decline of 11,000 units, or 12 per cent, from the July estimate and was 3,300 under the number started in August, 1947, the month that marked the beginning of last year's contraseasonal building boom.

The construction rate in the last few months has resulted in a total of 646,000 new permanent units being started so far this year, surpassing the volume in the corresponding eight months of 1947 by 24 per cent, or 123,400 units.

Anthratube Promotion

ANTHRACITE INSTITUTE HAS ANNOUNCED that a major promotional campaign is starting for the Anthratube, heating device developed by the Institute. Areas covered in the overall promotional campaign will primarily be the eastern half of Pennsylvania and northern and southern New Jersey. Anthracite region newspapers now on the Institute list will also feature special mention of the anthratube in their copy during this period. Institute advertisements in the heating, plumbing, architectural and building trades magazines will likewise plug the anthratube, this fall.

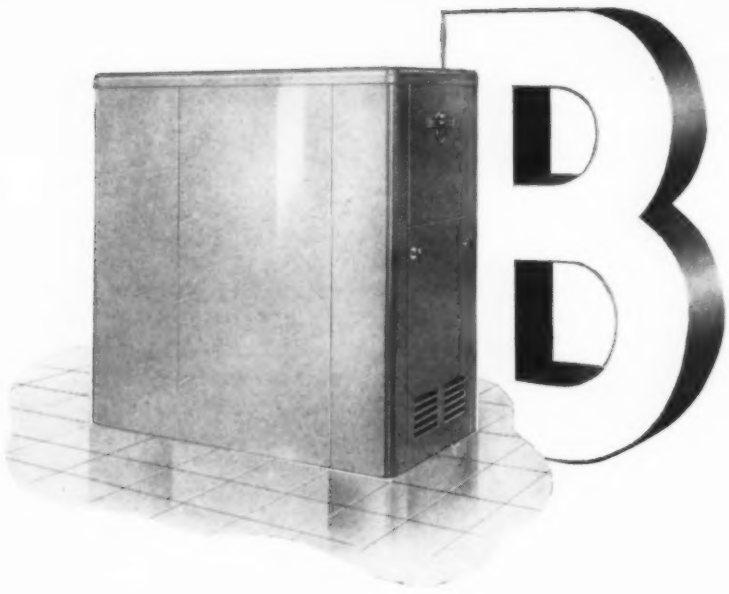
LP Gas Expansion

EXPANSION OF THE KATY GAS CYCLING PLANT, 25 miles west of Houston, Texas, one of the world's largest plants of its type, will result in a vast increase in the recovery of propane, one of the liquid petroleum gases, it was disclosed at the Fall Meeting of the American Society of Mechanical Engineers. Propane is sold as bottled gas for domestic fuel, and has many important uses, as in the textile industry, ferrous metal cutting, heat treating and for enriching utility gas.

Additional propane recovery units now being installed will "increase the propane recovery from approximately 30 per cent to 80 per cent of the hydrocarbons contained in the gas," according to William T. Robertson, design engineer of the Humble Oil and Gas Refining Co., operators of the plant.

RESIDENTIAL AIR CONDITIONING *Section*

INDOOR COMFORT – IN ALL SEASONS
FOR HOMES AND SMALL BUSINESSES



The Perfect Combination for Heating Comfort

"B" after the Unit Number means—

Waterbury

Equipped With Master Blowertrol

It means more SATISFIED CUSTOMERS—the end of stratification and "Cold 70"—more SALES and PROFITS for YOU. It adds more real meaning to our statement "It's What's Under the Casing that Counts!"

Now Standard Equipment on All Waterbury Air Conditioners*

After extensive tests by our Engineering Department we are convinced that the Master Blowertrol is the best means of achieving TRUE continuous blower operation. It expels the cool air from the ducts so gently that the occupants of the rooms are not aware of any draft. It gradually builds up speed until the thermostat is satisfied and then decreases until just a light movement of warm air is coming from the registers. Combined with precision-engineered Waterbury Air Conditioners, it is Modern Perfection in warm-air heating.

* With a Blower Motor of ½ h. p. or less.

THE WATERMAN-WATERBURY COMPANY

1122 Jackson St. N. E., Minneapolis, Minn.

Here's A Salemaker— The Modern Incinerator

At left is a fueled, kitchen model incinerator.

Shown above is a fuelless basement model.

THERE used to be an old minstrel song that had Mandy ask Rufus what he was gonna' do "when the rent comes around?" Thought of that leads us to ask you what you're gonna' do "when the heating sales slack down?"

Have you provided your selling men with an item that will enable them to break down the initial sales resistance of the homeowner? Something that can be used effectively in a good, old fashioned house to house canvassing campaign? You will be in a better position to face the days of increasing competition if you are familiar with the appeal of the modern, home sized incinerator.

A Modern Type

The incinerator we are discussing is not the roaring inferno type, that used to boil and bubble the garbage and produce plenty of foul odors while doing so. Dehydration has entered the picture in garbage disposal; that is, the waste matter and garbage is dried out until it is in condition to allow efficient burning. Different manufacturers arrive at this same point by different routes.

One type of incinerator uses a small gas pilot or electric coil to accomplish the dehydration while another uses only the natural draft produced by the chimney connection.

No Odors!

When this dehydration process has been completed the garbage is ready to burn and consume itself efficiently, without creating any foul odors. In the type of incinerator which uses a pilot there is no need for further attention after the garbage has been deposited; the fuelless incinerator has to be ignited when the charge is ready.

Installation is a simple matter since the fuelless incinerator need only be located near a chimney and connected to it by a 6 or 8 in. flue. This type is generally designed for utility room or basement installation. The fueled incinerator must obviously have a fuel supply connection in addition to the flue hookup. One manufacturer of this type of product has made basement and utility room models and then gone a step farther. A de luxe model has been produced that is made of auto body steel and porcelain enameled with a white finish that fits into any kitchen. It is regulation counter or range height and can be located anywhere as long as safety precautions are observed in placing it near combustible walls. The evidence indicates that if you sell them, you can put one of your less skilful men to work installing the incinerators.

How About Sales Appeal?

Now that we have described the incinerator, we can turn to just where it fits in the merchandising picture of the *Indoor Comfort* dealer. It is an item that is capable of high sales volume because it can be sold to anyone who has a home, no matter what the method of heating. One of the strongest appeals of this device is to the homeowner with automatic heat, because he is unable to burn any garbage in his heating plant without asking for trouble. And yet there are so many points of saleability to the product that it can be sold equally well to the man who is using a hand fired heating plant. If your prospect is already thinking of garbage disposal the incinerator will cost him less money than a plumbing disposal unit and offer greater convenience. You can't put paper down the sink, you know.

Tapping the Market

With such a sizable market established we can consider the various approaches that may be used to gain the maximum volume of sales for effort expended. As already indicated, the owner of the home that has automatic heat can be appealed to on the basis of disposing of his garbage as efficiently as he heats his house. Contacting the homeowner without automatic heat may turn out to be the first step in selling him a modern heating plant. If you install a convenience like the incinerator and he is pleased with its operation, when he is in the market for automatic heat you may make a sale with little effort. So, put those in your future book.

When it comes to the matter of the actual sales appeals to be used in merchandising the incinerator there are a number of excellent ones. As an example, if the housewife has to walk fifty to seventy-five feet out to the alley to deposit the garbage in a container it is likely that the thought of eliminating that chore, particularly in the wintertime, will be of definite interest. Then, too, there are many communities that do not have alleys and it becomes necessary to place the garbage out in the front of the house, to be hauled away. If you are able to rid the woman of the house of this task and also save the charges which are frequently made for garbage cartage, your sale is nearly made.

Sales Hints

The factors of convenience and economy can be strongly supported by that of hygiene. Anyone knows that disease and danger lurk in a fly-ridden, garbage laden alley and once the incinerator is installed that condition is instantly banished.

As it happens the incinerator is a product that can be easily demonstrated and it may be advisable to set one up in operating condition in your salesroom. In this way you will be able to let the prospect operate the device himself and see how simple it is.

Some dealers have adopted a practice of specifying the installation of an incinerator with each installation of automatic heat. It then becomes a matter of convincing the prospect that the small amount that the incinerator adds to the total bill for the installation will be more than repaid by the convenience that it offers.

Sales Summary

To summarize the case for the incinerator we see that it is a fast-moving product that can be sold easily, thus giving the salesman an ace in the hole if he is unable to sell a furnace. In this way it is a double threat, for if he cannot sell a heating plant, he may be able to sell an incinerator; if he does sell an incinerator, he may be able to make that heating sale later on. Thus the incinerator serves as a business builder for the contractor, helps the salesman maintain an income and, with all this, actually benefits the customer in several ways. What more can you ask of a product?

Dig Out That Scrap!

ON THE NEWS PAGES OF THIS ISSUE there is a report that Commerce Secretary Sawyer held a meeting with officials of trade associations that have manufacturer members who use iron and steel for the purpose of initiating large-scale scrap drives to help relieve the critical shortage of this essential commodity.

George Boeddener, managing director of the National Warm Air Heating and Air Conditioning Association, has issued an appeal to the members of the Association to participate to the fullest extent in this action. Mr. Boeddener says, "Last winter, as you know, there were mills and foundries shut down for lack of scrap. This year 3,000,000 more tons of scrap will be consumed than ever before because of increased capacities and production, that is, providing that additional amount of scrap can be made available.

"Numerous scrap drives by automobile manufacturers, railroads and agriculture have produced substantial volumes of scrap. The scrap that is desired is the scrap in your plants and warehouses in the form of obsolete materials, equipment, dies, fixtures and worn out machines and tools. The heavy stuff.

"Let's cooperate while scrap prices are high and get rid of all that old stuff around the plants and warehouses."

Mr. Boeddener's suggestion is most timely and it would be well for everyone in the industry to start a scrap drive immediately that will bring every available pound of useable scrap out of hiding and put it back into circulation. All users of steel products will benefit by such action.

The Outlook for Steel

HAROLD J. RUTTENBERG
Executive Vice President,
Portsmouth Steel Corp.

This is the text of a speech delivered before the last annual meeting of the National Heating Wholesalers Association. The speaker spent ten years as research director of the United Steel Workers of America and during the war became a director of the War Production Board. His views are backed by considerable knowledge.

THE views that I hold on the outlook for steel are not those of the steel industry generally. I have never had the honor of having an older man with forty years of practical experience and business behind him agree with me during the past eight years about the outlook for steel but then they have never had the honor of being correct in their predictions on the outlook for steel during the past eight-year period.

The arguments pro and con about the adequacy of American steel capacity for 1940-41 are now history. I am sure no one in this room would be able to say where we would be today without the facilities for 15 million tons of ingot capacity and 10 million tons of pig iron capacity that were built during the war—nor how we could have won the war without them. The industry maintained that those facilities were not needed and they maintained that when hostility ended production would be 70 per cent of capacity. Industry was wrong. They have been unable to fill the demand for steel except for brief periods of time in any category in their finished products.

Last December and January and February of this year we had our depression pants on again, all of us did. There were predictions that steel would be plentiful and we should cut down inventories. I heard a man say today that the president of a very big corporation predicted we will have steel in September. That same chap has said that each six months for quite some time and if he lives long enough some day he is going to be right. Every dog has his day and some day I am going to be wrong.

Oil and Steel

But the inadequacy of steel is well known. Every capacity is committed to the ship companies and other companies and there isn't going to be any surplus of steel this year. Pig iron is so short it is almost tragic. On oil, you fellows are really caught in the squeeze. We use two million gallons of oil a month—24 million gallons a year at the Portsmouth Steel Works for steel and we are paying more than 100 per cent per gallon for that oil over what we did ten years ago.

There is a shortage of oil and gas because there is a shortage of steel with which to transport that source of energy. The demand for pipe in the oil industry and gas industry extends into 1954. You fellows are really caught in the sales end because you are limited in selling new installations. Either there isn't the fuel or the fear exists that there won't be the fuel to adequately operate them, once they are installed.

On the other hand, the manufacturers of the basic units are themselves restricted in their production of those units because of shortages—not only of steel but of iron.

Pig Iron

There is nothing new about Ruttenberg advocating expansion of steel capacity. But I think there is one thing that has come about over the past year that is undeniable. I don't think there is room for controversy among any of those in responsible positions in industry as to the inadequacy of our pig iron capacity. No greater service could be rendered in the fight against inflation than to build eleven or twelve big plants to increase the capacity by several million tons a year. It would bring down the price of scrap.

There is a great and tremendous shortage of pig iron in this country—not only for the steel industry but for the foundries as well. About forty-five or fifty years ago the idea came into vogue of using up our previously produced steel and iron as a source of raw material in the process. Refining and redeveloping has become a tremendous industry without which we could never have grown as we have as a nation.

The only thing wrong with that is that we have melted it up over the past fifty years. The industry is consuming in the neighborhood of two million tons of scrap a month and the only program so far to relieve the shortage is to bring over from Europe 2 million tons of scrap. The mills will be glad if they get one million. They are talking about getting a month or two weeks supply at the most from the supply abroad. It will melt like a snowball in Hades—a million ton brought from overseas.

Need Modern Blast Furnaces

You can argue about steel capacity with abandon and project fancy theories and statistics into the ethereal. I won't indulge in this because I know what statistics are since I am a professional statistician. They are merely arithmetical expressions of your judg-

ment. If you know a man's judgment you know what kind of figures he will produce.

So I won't give you the figures. I will give you the judgment. I will spare you the trouble of analyzing them. Construction should begin immediately on ten or eleven new modern blast furnaces that will produce 1500 tons of iron a day. The foundries could then cut down costs and cut down the tremendous price they are paying for scrap today. The whole level of scrap iron and steel prices in this country would be reduced substantially if not pegged at present levels. This would be a definite accomplishment in view of the fact that we are now confronted with the prospect of another increase in the price of scrap because of the persistent shortage.

So I say that no one can successfully challenge the need for construction of new modern 1500-ton-a-day blast furnaces. The case is undeniable. Back of that, of course, are required expansions in the coke plants to open up coke and iron ore mines to supply the blast furnaces with their two essential ingredients.

Those expansions are not only necessary—they are possible. The day of cheap coal, of course, and cheap iron ore is gone. The ores and coals of the future will be beneficent products and as a consequence their cost will necessarily be higher. But our whole plateau of prices is on a higher level so that is something that this country can take in its stride.

More Homes Plus Increased Use

We are coming to the adequacy of steel capacity. There are several ways to express it. There is one fallacious idea, and that is that some kind of theoretical pipe line is being filled up with steel and once that pipe line is filled there will be an overnight surplus of steel. There is going to be an overnight surplus some time, but I don't think it will be from that.

Let's go to the automotive field. They made three and a half million passenger vehicles last year and will be lucky to make that many this year. Some will be exported. How many more people are there in America today than there were ten years ago? I will give you some statistics. I think there were 3.7 million births in this country last year and 1.4 million deaths. There are about 10 million more people than in 1940 and we haven't yet been able to get enough steel to replace the number of automobiles we had in 1940, let alone to satisfy the increased population.

Let's take the home town of you older men when you were boys forty or fifty years ago and add up how many pounds of steel there were in that town or in your home at that time. Add up the number of pounds of steel and divide it by 50 per cent, because it takes two tons of ingots, roughly, to make one ton of completely fabricated product. Then add the 25 pounds of minerals in your home and figure how many homes there are in the country today compared to forty or fifty years ago.

Another thing, look at the character of the product. When Henry Ford built the automobile and made a big success out of it he built a high machine that was easy to repair and work on. You can't sell a piece of transportation today. You have got to sell a drug store with it.

When the electrical icebox first came out the machine was exposed and now you have to hide the machine. What do you hide it with? You hide it with steel sheets. The entire automobile is hidden with steel sheets.

How about your heaters and furnaces? When you go into a modern house today and go down in the cellar and hunt around for the furnace you can hardly distinguish it from the washing machine—it is all hidden with steel sheets.

Steel for Decorative Purposes

There is a tremendous need for steel sheets for decorative purposes to meet the consumer demand and design in the automobile. Where is all the steel going? That's where! Some day it will back up on us. Yes, some day, it will, but I will say that with the present world picture with America being the only industrial nation in the world that was not devastated by the last war, a nation that has to supply not only its own needs but the steel needs of that part of the world that orients toward us, we can't do it with 90 million tons of steel capacity. It just isn't enough. You can line up all of the statistics you want and they will revert to the basic question.

Who could foresee the ERP that would take $5 billion? I don't know that that required any great genius. I foresaw it as soon as I saw reports and confirmations of the destruction of steel facilities. It was quite obvious that replacement would come from this country.

The steel industry thinks the demands being made upon it today by our military forces and the State Department are great. Wait until they see the demands made a year from now. Today's will look picayunish beside those.

I want to close by saying one word. I am not so foolish and naive as to believe that some day steel is not going to be short but that day will not be until our money mechanism breaks down and the flow of purchasing power gets clogged up. For long years to come steel is going to be short. It will loosen up in this or that product, but it takes a little time so that it adjusts itself somewhere else. Industry will naturally adjust itself whenever its overall demand of a product is over its overall capacity.

Steel Short for Years

As long as free purchasing power exists there won't be enough steel to meet the demand. When that mechanism breaks down and we have a recession or depression there will be a surplus of steel and oil. There will be a surplus of everything but jobs then. I can't predict when that will come about and I wouldn't dare, but I will point out what has happened this past year. Congress has increased the appropriation of the air force by two or three billion dollars, gave the ERP $5 billion and made a tax cut of $5 billion. That is better than a billion dollars a month of purchasing power in this country, with which to buy steel products.

Let me cite another case. Take steel as an example—10 per cent of our steel is being exported, 10 per cent was last year, and it is being exported at that rate this year and another 10 per cent is being exported in fabricated form in trucks, machinery and so forth.

That is a great source of pressure and source of in-

(Please turn to page 154)

Research in Venting Gas Fired Equipment (I)

C. E. BLOME* & J. L. BRAY**
Purdue University

The title given above is subject to a qualification. "When no masonry chimneys are available", and the field investigation described in this series was made to find examples of what not to do in venting practice. Seven rules for good venting are listed in the second article, next month. This material was originally published in Engineering Bulletin #103 prepared by Purdue University for the American Gas Association Committee on Domestic Gas Research.

PEOPLE constantly ask, "Why is a vent necessary on a gas-burning appliance as long as there are no smoke particles contained in its products of combustion, and the combustion gases are not obnoxious?"

Essentially vents attached to gas-burning appliances should perform the following functions:

1. Provide a safe and effective means for moving the products of combustion from the draft hood to the outside atmosphere without contaminating the room air.
2. Provide the mechanics of producing and maintaining a draft which induces a supply of replacement air into the room in which the appliance is situated.

To understand better the demands put upon a gas vent, let us examine the products of combustion from 1000 cu ft of natural gas which we will assume to be pure methane. For purposes of illustration, let us also assume the natural gas is 1000 Btu gas and enters the heater at 70 F. It is possible to burn the 1000 cu ft of gas with slightly less than 10,000 cu ft of air. This would require perfect mixing and combustion, which, in practice, is most difficult. If mixing were not perfect, if a molecule of oxygen failed to unite with each atom of carbon to produce carbon dioxide, incomplete combustion would result in the production of deadly carbon monoxide gas. (Carbon monoxide gas is the result of only one-half molecule of oxygen uniting with one atom of carbon.) In practice, to prevent carbon monoxide formation, a larger quantity of air is made available, normally 12,000 to 14,000 cu ft per 1000 cu ft of gas. In either case the products of combustion would contain 1000 cu ft of carbon dioxide and 2000 cu ft of water vapor plus large quantities of nitrogen as well as excess oxygen at 1 atmosphere pressure. These must all be heated, thus lowering the efficiency of the appliance.

Nitrogen, one of the main constituents of the earth's atmosphere (79 per cent) is non-toxic, and carbon dioxide in concentrations usually encountered is harmless. Water vapor is likewise harmless, but under certain conditions it is most undesirable, as is shown below.

If condensed, the 2000 cu ft of water vapor in the above example amounts to roughly eleven gallons of water. An unvented 50,000 Btu space heater adds eleven gallons of water to the occupied space for every 20 hours of continuous operation. The moisture production rate is then 0.56 gal per hr.

It becomes obvious, therefore, that the above quantities of water released into a confined space hour after hour would soon increase the vapor content of the air to a value above that corresponding to the dewpoint temperature of the surrounding surfaces, causing the water vapor in the air to condense on the colder surfaces.

While it is true that most space heaters operate intermittently, there are other factors, such as the living habits of the family—cooking, washing, drying of clothes, bathing, showering, mopping, breathing—which add water vapor to the total moisture content of the occupied space.

Counteracting this rapid build-up of moisture content are several factors such as dilution due to infiltration, moisture permeability of surrounding surfaces, and vapor pressure differentials. In the average home these would serve to delay, but hardly prevent, condensation, at the above rate of moisture release when outside temperatures are below freezing. Let us therefore simplify our illustration by not considering their influence in this discussion.

The initial evidence of excessive quantities of water vapor in confined spaces generally appears in the form of condensation on windows. While most of us are

* —*Research Associate*
** —*Professor, Metallurgical Engr.*

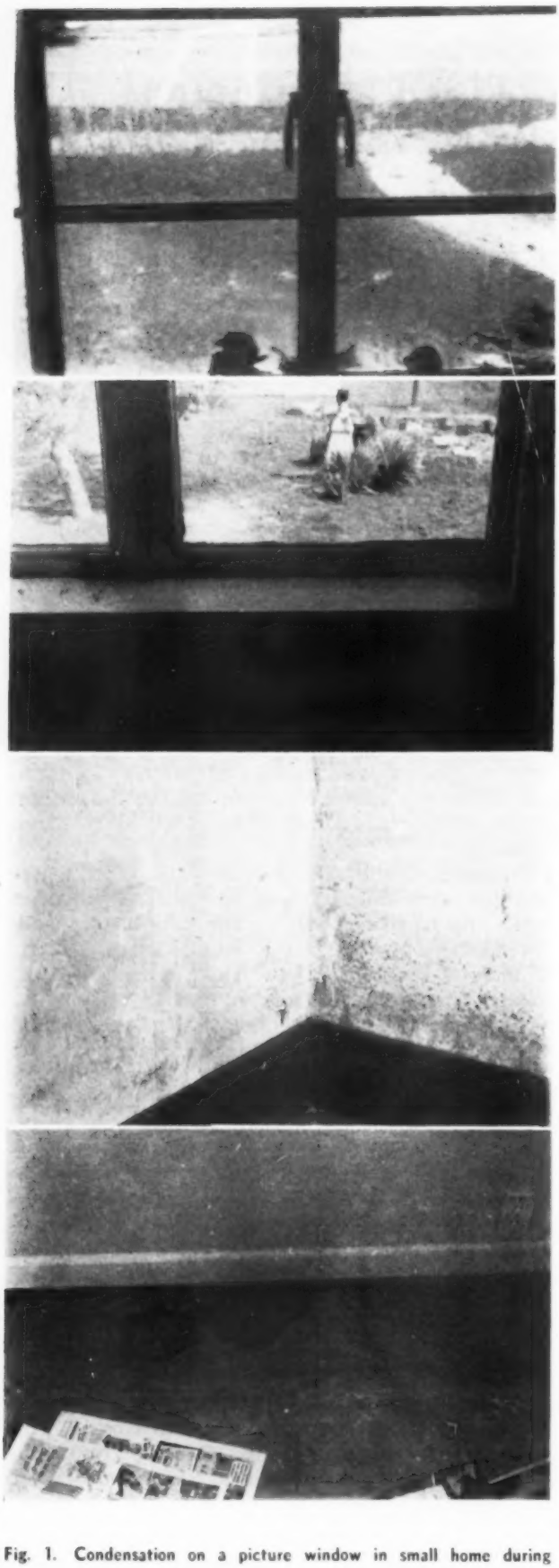


Fig. 1. Condensation on a picture window in small home during warm weather. Fig. 2. Rotted bottom rails, a result of excessive condensation. Fig. 3. Mildewed wallpaper. Fig. 4. Condensation actually forms pools of water on the floor.

familiar with and consider this phenomenon as commonplace during winter months, some home owners are plagued with this bothersome problem during the summer months.

Rotted window rails, damaged interior decorations, puddles of water on floor, mildew on wallpaper and in closets, ceiling water stains due to attic condensation, warped doors, inoperative cabinet and dresser drawers, buckled floors, and an unusually clammy feeling to the air are but a portion of the unpleasant results of excessive water-vapor condensation.

It becomes evident, therefore, that it is decidedly advantageous to remove the water vapor to the exterior atmosphere while it is still in its gaseous state. The successful completion of the above process constitutes good venting.

The second purpose of a vent is frequently overlooked—to provide the mechanics of producing and maintaining a draft which induces a supply of replacement air into the room in which the appliance is located. In the illustration used above, the 50,000 Btu space heater consumes approximately 50 cu ft of natural gas per hour (1000 Btu gas) and 600 cu ft of air per hour for combustion. In addition, the average gas appliance uses approximately 100 per cent air dilution at the draft diverter. The total quantity of air removed from the occupied space per hour of operation is then 1250 cu ft (2 x 650 — 50 = 1250 cu ft per hr). At 70 F (room air temperature) this amounts to 93.875 lbs. of dry air per hr.

Unless adequate means for the replacement of air is provided, the vent, by virtue of exhausting the products of combustion and the dilution air to the exterior, creates a subatmospheric pressure within the confined space; incomplete combustion because of lack of sufficient oxygen results. Obviously, the same quantity of air that is used in combustion, plus the amount leaving the room through the vent via the relief opening of the draft diverter, must be replaced.

The pressure differential thus created tends to force replacement air into the confined space through cracks around doors, windows, joints, etc., through other openings such as water-heater vents or vents of other appliances or through chimney flues, etc.

From a theoretical standpoint, air movement must be obtained by an applied force (pressure differential). Air cannot be pulled in, as there are no cohesive or adhesive qualities to air. Replacement air, when seeking its way in, will always follow the line of least resistance. There is far less resistance in a 3 in. or 4 in. vent or an 8 in. x 12 in. chimney flue than in tiny cracks around doors and windows. When replacement air is forced in via vents, chimney flues, etc., it should be kept clearly in mind that all the products of combustion (nitrogen, carbon dioxide, water vapor, and possibly carbon monoxide) also enter the confined living quarters whenever an appliance or fireplace is in operation.

It is common knowledge that combustion cannot continue and human beings cannot exist in comfort without an adequate supply of oxygen. We ought not then restrict the free flow of replacement air. Instead, provision should be made to assure an adequate supply of oxygen for combustion and health. Many combustion and venting problems are solved by making cor-

Fig. 5. Fresh-air intake supplies fresh air at base of water heater and furnace.

rections of this nature. This is especially applicable to the modern tightly constructed home.

The specific heat of air is 0.24 Btu/lb/°F. It is not expensive to heat reasonable quantities of cold outside air. There is a common misunderstanding on this point that must be overcome in the minds of most persons. In fact, research now underway at Purdue on another research project shows that in many cases it is actually less costly to heat homes when adequate oxygen is available.

Theory of Vent Operation

Because of the numerous uncontrollable factors which influence, and sometimes temporarily control, venting operations in actual field installations, it seems expedient, for purposes of illustration and clarity, to eliminate all such disturbing factors by assuming our vent to be operating in still air at constant 60 F.

The movement of combustion gases through a vent under the above conditions is dependent entirely on the motivating force created by the difference in weight of two columns of gases. The one column is that of the combustion gases. Its volume is equal to the cross-sectional area of the vertical portion of the vent times the height of the vertical portion. The weight of its gases is equal to the above volume times its density. The second column is made up of the air surrounding the appliance. Assuming that provision has been made for a constant supply of fresh air to the fire, the second column of air then becomes that of an equal volume of outside air and its weight is the product of its volume times its density.

During burner operation the two columns of gases will of necessity be at different temperatures. Since density of gases is a function of temperature, the difference in weight of the two columns will therefore be proportional to and a direct function of the absolute temperature differential. In other words, the greater the temperature differences, the greater the density differences, and hence, the greater the difference in weight of the two columns of gases.

When a given volume of air (1 cu ft) is heated above the surrounding air temperature, it expands (other factors such as pressure, etc., remaining constant). Assume the temperature of the original volume (1 cu ft) to have been 60 F and to weigh 0.07655 lbs at 1 atmosphere. If heated to 200 F the original cu ft of air at 1 atmosphere will now occupy 1.27 cu ft and 1 cu ft of the heated air will now weigh only 0.060298 lbs.

The combustion gases (now approximately three-fourths as dense) are forced upward by the heavier (more dense) air. (Oil released below the surface of water is an example of this principle.) The amount of energy available to buoy the combustion gases upward in a vent attached to modern, efficient gas-fired appliances is exceedingly small.

To comprehend better the total force available to move combustion products through a vent, let us consider a 4 in. vent 20 ft. high filled with combustion gases at 200 F average temperature. To simplify the illustration, let us have no horizontal run and assume that there is no friction. This vent will theoretically form one side of a U-tube, the other side being formed by an equivalent column of the surrounding atmosphere. The surrounding atmospheric temperature we will assume to be 60 F.

The weight of the column of combustion gases is 1.74 cu ft x 0.060298 = 0.10491 lbs and the weight of the column of air is 1.74 cu ft x 0.07655 = 0.13319 lbs. The difference in weight of the two columns (0.13319 — 0.10491 = 0.02828 lbs) supplies the force to move the products of combustion through the vent to the outside. By dividing this difference (0.02828 lbs) by the cross-sectional area of the vent (12.55 sq in.), we determine that the force per sq in. is 0.002 lb. Converted into terms of draft, 0.002 lb per sq in. equals 0.055 in. H_2O.

As pointed out above this energy is a function of temperature differential—the greater the temperature differential, the greater the energy available. In view of the small amount of energy available, it is entirely reasonable that we should conserve every bit by guarding against losses whenever possible.

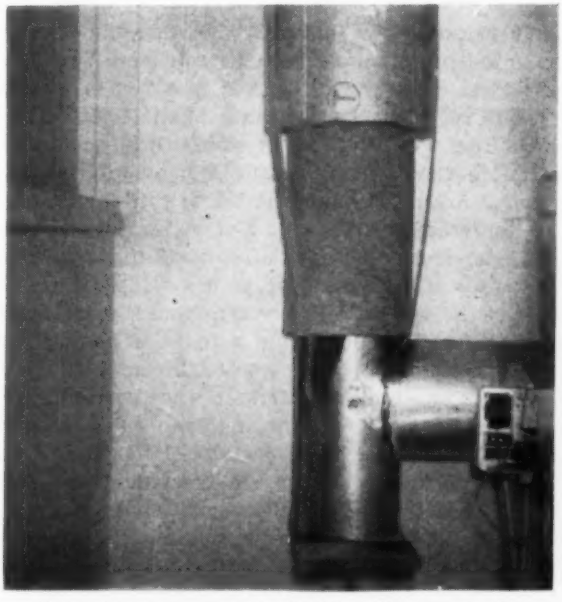
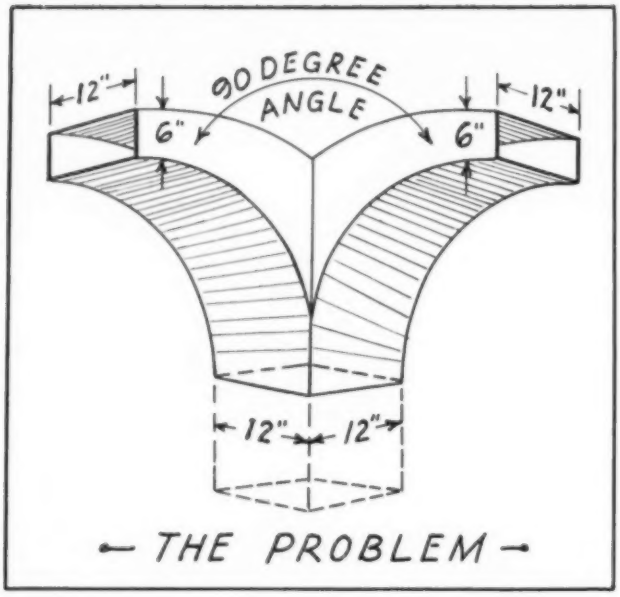


Fig. 6. Soot collection on vent T in air-tight utility room due to oxygen starvation, followed by reverse vent operation to replace air in room.



Pattern Development for Air Conditioning Fittings*

By WILLIAM NEUBECKER

Square to Double Rectangular Duct Fitting

A CORRESPONDENT requests information for laying out the patterns for a two branch fitting. This demonstration in connection with the full page drawing presents an interesting as well as an instructive pattern layout for a heating or ventilating fitting presented in the perspective view shown. Note that the dimension of the square duct is 12 by 12 in., from which two rectangular branches are taken, each 6 by 12 in., so as to form an inner angle of 90 deg as indicated in the perspective view. This makes the area of the main duct equal the area of the rectangular outlets or, $6 \times 12 = 72 \times 2 = 144$; $\sqrt{144} = 12$; $12 \times 12 = 144$. At first glance it would appear to be a difficult problem to develop, but on further study, the simple form of layout, parallel line development was found to be adequate.

Drafting the Elevation, Plan and Pattern for Outer Sides of the Two Branches

Now referring to the full page drawing, the first step is to properly draw the elevation and plan as follows: First draw the horizontal line 7-C in elevation on which set off the 12 in. width of the square duct as shown from 7 to *b*. Now set off the desired radius of the heel 7-A or 24 in. and using A as a center with A-7 as radius draw the quadrant 7-2 to intersect the vertical line erected from A at 2. On the same line 7-C, set off the desired throat radius or 18 in. from *b* to B as a center with B-*b* as radius draw the quadrant to intersect the vertical line erected from B at *x*. From *x* draw a short horizontal line *x* to 14 to connect with the horizontal duct to be erected. From 14 draw the perpendicular line to intersect the horizontal line drawn from 2 at 1. At right angles to 7-C from points 7 and *b* draw the lines 7-8 and *b*-9 to connect with the vertical square duct to be erected. Draw a line from 8 to 9. It should be understood that the horizontal connection at *x*-14 and the vertical connection at 7-8 can be made anywhere. Then 1-8-9-14-1 will be the true elevation, as well as the net pattern for the outer sides indicated by *d*-8 in elevation. In its proper relative position below the elevation draw the plan view of the two arms or branches. While the two branches are shown in plan, in practical work it is only necessary to show the horizontal arm or branch with its miter or joint line 7′-*a*′.

Developing the Pattern for Both Heels

To obtain the pattern for both heels proceed as follows: Space the curve of the heel in elevation in equal divisions as shown from 2 to 7. Now draw any horizontal line as 1-7, (at the bottom of the drawing) on which place the various divisions 1 to *a* to 7, obtained from similar numbers on the heel curve in elevation. From these divisions at right angles to 1-7, draw lines indefinitely as shown. Now measuring in each and every instance from the line 7′ -a° in plan take the various distances to points of intersections on the miter line 7′-a′ and set them off on the heel pattern, measuring in each and every instance from the line 7-1.

Through points of intersections so obtained trace the curved line 7-F. Then 1-7-F-E-1 will be the net pattern shape for both heels, the one formed right and the other formed left, to make the outer 90 deg angle of the double branched fittings.

Pattern for Inner Sides of the Two Branches

For the pattern shape for the inner angle sides of the branches, simply take a tracing of 1-*a*-*b*-14-1 in elevation and reverse it on the line *a*-*b* and obtain the pattern shape indicated at the right. The practical way of laying out this pattern directly on the sheet metal is as follows: Draw any line as shown by C°-C° at the right of the drawing.

Now set off the divisions shown in the side elevation by C-B-A and *b* and set them off on the line of C°-C° as shown by similar letters on the line C°-C°.

From C°-B°-A° and b° draw lines at right angles to

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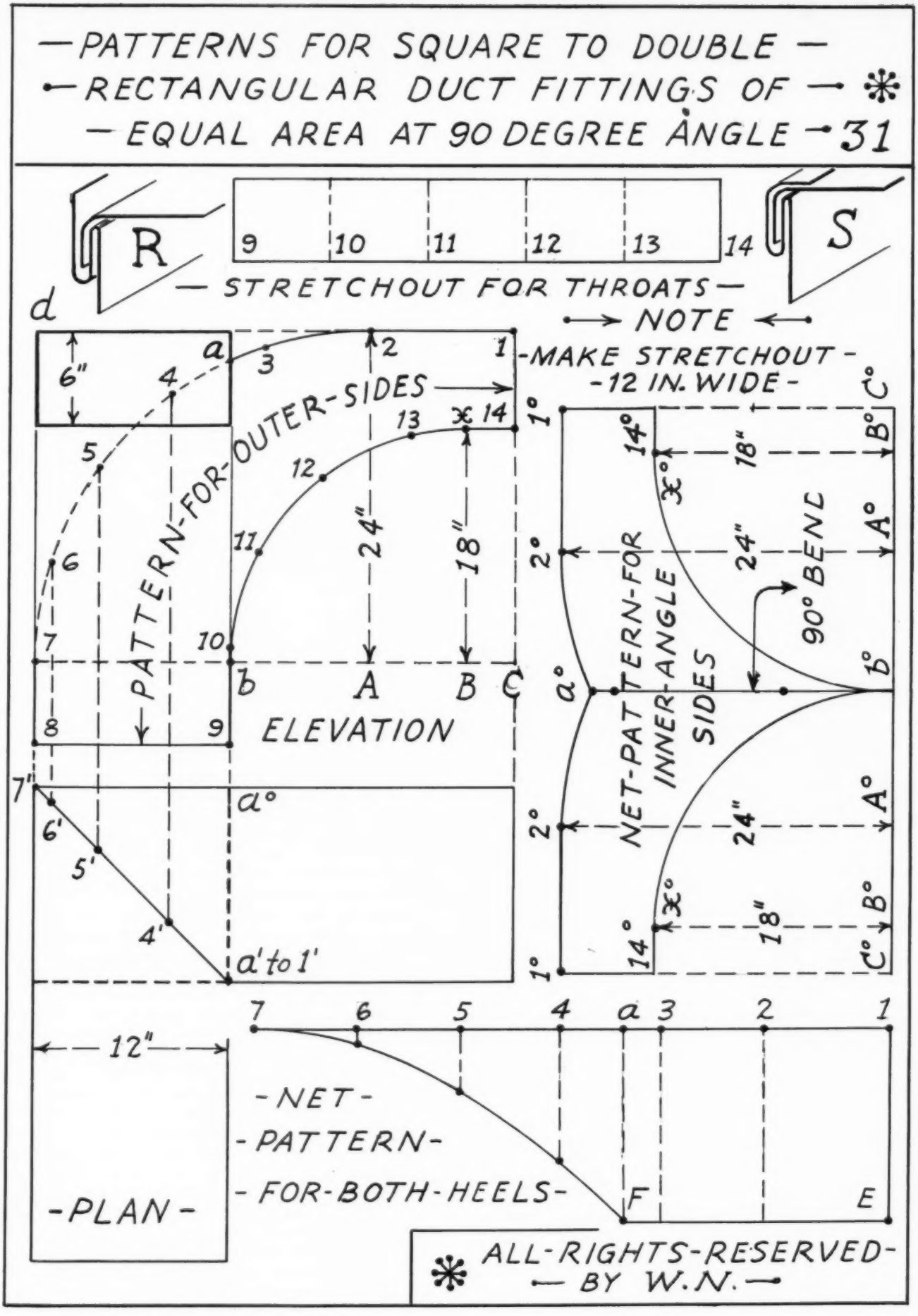
—PATTERNS FOR SQUARE TO DOUBLE— —RECTANGULAR DUCT FITTINGS OF— ✻ —EQUAL AREA AT 90 DEGREE ANGLE— 31



Design of Refractory Fire Boxes

R. L. WAER
Refractories Division
Babcock & Wilcox Company

PRESSURE BURNERS, low-pressure gun-type burners, and horizontal rotary-cup burners, which are all of the atomizing type, deserve efficient fireboxes to enable them to operate at maximum efficiency. The burner prepares the oil for burning, but the actual combustion takes place in the firebox. Therefore, no matter how well the burner does its job, and modern burners do it extremely well, complete satisfaction will not be obtained unless it is equipped with a well designed, carefully installed firebox made from the proper refractory materials.

The characteristics of a good firebox may be summarized under three major headings:

1) Ability to heat up rapidly to a temperature high enough for efficient combustion
2) Effective insulation
3) Durability

Rapid heat up has always been important. It is doubly important today, with the trend toward shorter burner "on" periods and the increased use of heavier grades of fuel oil for domestic heating. Tests have been run on fireboxes of many types, shapes and sizes, using good burners carefully installed. The results proved conclusively that cold, slow-heating fireboxes, made of heavy firebrick, were the chief cause of excessive soot, oil odors and smoke. The reasons were not difficult to find. A cold firebox chills the flame—chills it below the temperature necessary for complete combustion. From this, a whole series of ills result. First among them, of course, is the wasting of oil. Secondly, the excessive sooting up of the furnace or boiler cripples its heat absorbing qualities, still further reducing efficiency. Thirdly, incomplete combustion allows oil droplets and vapors to escape from the combustion chamber, causing unpleasant odors.

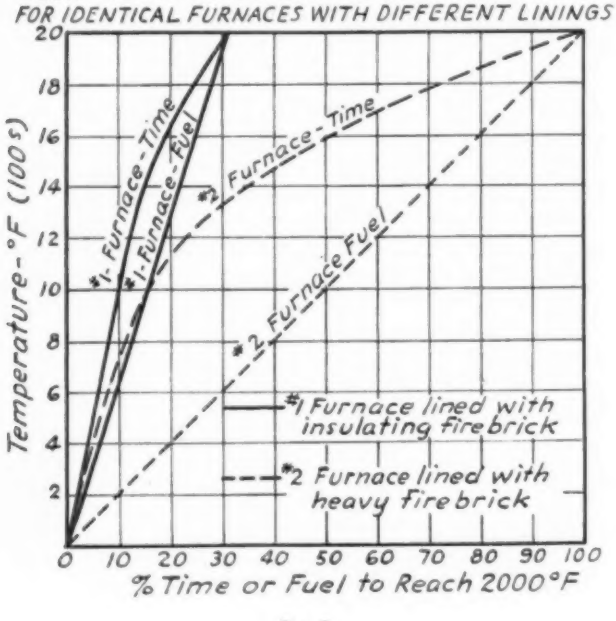

RELATIVE HEATING TIMES & FUEL REQUIREMENTS
FOR IDENTICAL FURNACES WITH DIFFERENT LININGS
Temperature - °F (100's)
% Time or Fuel to Reach 2000°F
#1- Furnace - Time
#1- Furnace - Fuel
#2 Furnace - Time
#2 Furnace Fuel
#1 Furnace lined with insulating firebrick
#2 Furnace lined with heavy firebrick

Fig. 1.

The tests showed that most of these difficulties occurred during the first few minutes of operation, when the firebox was too cold to adequately support combustion. There are two important steps in securing rapid heating fireboxes:

1) Selection of the proper refractory material
2) Proper design and installation

Insulating Firebrick

Insulating firebrick is a term applied to a class of lightweight refractories that possess definite insulating characteristics and are also suitable for direct exposure to furnace gases in the combustion zone. They are classified into several temperature groups from 1600 F to 2900 F according to their bulk density and resistance to permanent linear change at specified temperatures. Within each temperature group the weight of the individual insulating firebrick is not the same for all manufacturers. For one large manufacturer, the weights range from 1.1 lbs per brick in the 1600 F group to 2.96 lbs in the 2900 F group.

Insulating firebrick are usually made from the same type of refractory clays used in regular, heavy firebrick, the important difference being that they are porosified during manufacturing. In most cases this porosity is obtained by mixing the clay with finely divided carbonaceous material, such as wood or cork, which is burned out during the firing process. Because insulating firebrick weigh less than regular firebrick, they have a lower heat storage value than the latter. Their porous structure also makes them highly effective insulators against the loss of heat by conduction. Thus, because they store and conduct less heat, they permit quicker heating of the furnace and require considerably less fuel to bring them up to temperature. These savings were strikingly demonstrated in tests on two furnaces, identical in size, burner equipment, and all other respects except that one was lined with insulating firebrick and the other with standard heavy firebrick. Relative performances are indicated on the graph marked Fig. 1.

What insulating firebrick mean in the way of fuel savings has been demonstrated in many hundreds of comparative installations. In one case, for example, no changes were made except to replace an old firebox of dense firebrick with one made of insulating firebrick. Carefully controlled tests indicated a fuel savings of 35 per cent. On many other tests, savings of 15 to 25 per cent were noted.

Insulating firebrick have long been recognized as an ideal refractory for domestic fireboxes. Because of their effective insulating and low heat-storage properties, a thin skin facing the furnace heats up with great rapidity as soon as the burner starts to operate, and quickly supplies the high temperature needed for complete combustion. Because they concentrate the heat, so to speak, insulating firebrick will also provide a higher average temperature during the period the burner is on.

Insulating firebrick also make two important contributions to reducing noise. First, their structure is such that they actually behave like acoustic block. A second important factor in noise reduction is brought about by the higher flame temperatures made possible by insulating firebrick. Higher flame temperatures reduce both the rapid periodical detonations which cause roaring and the slower periodical detonations which cause flame panting.

In addition to these benefits resulting from rapid heat-up and higher temperatures, insulating firebrick materially reduce the loss of heat to the basement floor. This is a loss which has sometimes been overlooked, but it can be an important drain on the oil tank, considering that heavy firebrick transmit more than six times as much heat as the same thicknesses of insulating brick in the 2000 F group.

Firebox Dimensions

Assuming that correct materials are being used, poor results may still be obtained if the shape and size of the firebox are not correctly proportioned. Where the shape of the boiler or furnace base permits, always make the firebox shape fit the flame shape the particular burner tends to give. Then proportion the size of the firebox for the expected firing rate. The two tables (Fig. 2 and 3) give recommended firebox dimensions for, respectively, burners having normal flame shapes and for those with narrow flames.

The above dimensions will provide fireboxes large enough to allow for the irregular flame shapes of certain burners, and for firing about 30 per cent harder than first was calculated, in case gph rates were not accurately determined beforehand. Experienced installers who are figuring gph rates closely should study the results of their first few installations to find out if smaller fireboxes could be used without the risk of flame impingement on the sides or back wall. If they conclude this is practical, they may make their new fireboxes one size smaller than indicated. For example, to build a firebox for 1.3 gph they will use the 1.0 gph dimensions, etc.

Building the Firebox

The following suggestions will be of assistance in securing an efficient, rapid-heating, durable firebox:

1. Clean the inside of the furnace or boiler thoroughly, working from top to bottom.
2. Using an extension light, search for air leaks between boiler sections, at the top and bottom of the ashpit, and around door frames. Seal leaks carefully with furnace cement.
3. Build the firebox, using the proper insulating firebrick and the type of mortar recommended by the manufacturer. Lay the floor first, making it large

(Please turn to page 158)

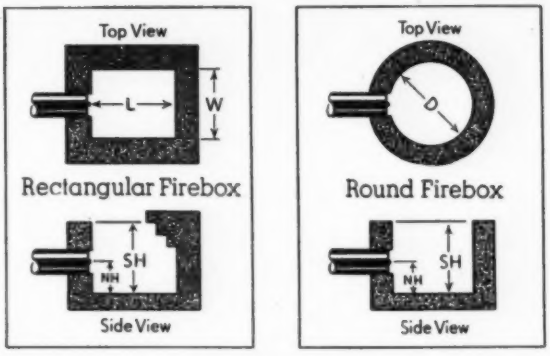


Fig. 2. Suitable for boilers and furnaces having bases which are not exceptionally narrow or short and for flames of normal shape.

All dimensions are in inches

GPH rate	Noz. Hgt. NH	Side Hgt. SH	Rectangular Box Width W	Rectangular Box Length L	Round Box Diameter D
1.0	6	14	10½	12	12
1.3	6	16	11½	13½	13½
1.7	6½	16	12	15	15
2.0	6½	16	13	16	16½
2.5	7	16	14	17	18
3.0	7	18	16	19	20
4.0	7½	18	17½	20½	23
5.0	7½	18	19	22	26

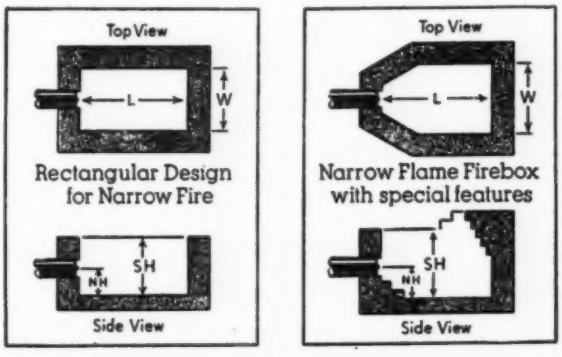


Fig. 3. For boilers and furnaces having bases which require narrow fireboxes, which are fired by burners adjusted to give long, narrow flames.

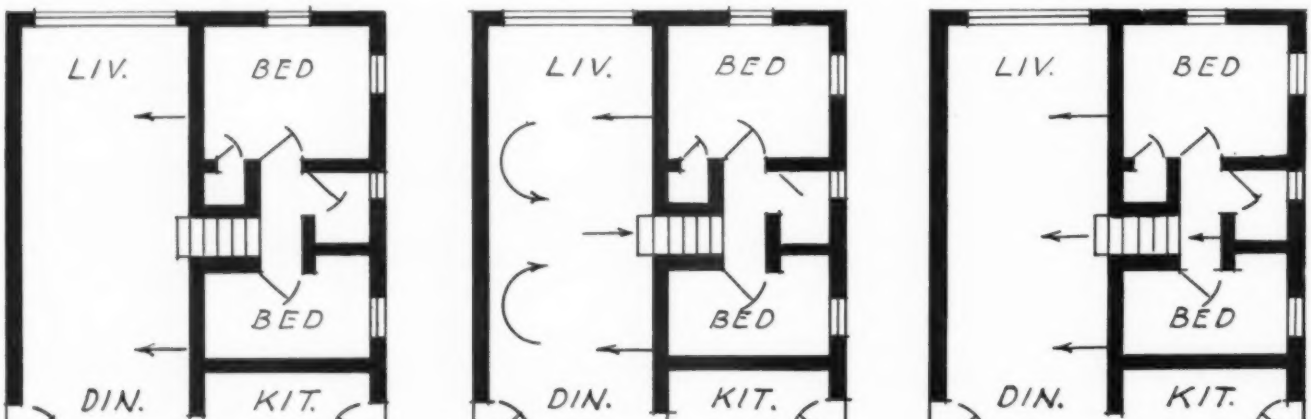
GPH rate	Noz. Hgt. NH	Side Hgt. SH	Width W	Length L
1.0	6	14	9½	14
1.3	6	14	10½	16
1.7	6	16	11½	18
2.0	6½	16	12½	20
2.5	6½	16	13½	22
3.0	6½	16	14	24
4.0	7	18	15	27
5.0	7	18	16½	30

The Case Of The Chronical Kicker

By SUREWARM HOMES

THIS is the case of the chronical kicker, or even the great Surewarm Homes can be wrong. In fairness to my readers (one or more, I hope), I think it is only proper that we examine my own files to see whether I have ever been wrong. The answer is a great big YES.

During my long and pleasant association with people in this industry I had the pleasure of working with a chap who, although a good engineer and a nice fellow, liked to use big words whose pronunciation or meaning he was not sure of, one of these expressions being 'chronical (chronic) kicker," which term he applied to any customer whom he could not satisfy. I have always felt that in all cases where a customer complains, the customer was right, and that there must be something which I should find and correct, as in most cases customers are a happy lot and easily satisfied. However, this case was one of my most baffling.



The woman in the case, as there must always be one (cherchez la femme!) was very beautiful and so it was always a pleasure to call on her. However, there was a limit to her patience and mine, and I was just about to put her in the class of a "chronical kicker" which would have shattered my faith in myself and the warm air business. It seemed that even though I had done the heating in an even dozen of this particular type of 2-level home, all from the same plan with a very slight variation in details, this was the only one which was giving trouble, and from its particular layout, which seemed to be ideal, I had felt there would be no possibility of its not heating perfectly.

As usual, I was using constant blower operation with high side wall registers. The combination living room and dining room (30 feet in length) extended across the south end of the house with no windows along the south or outer wall, a large window extending from floor to ceiling the entire width of the room at each end. The supply ducts, as I mentioned, were in the high side wall of the north wall seven feet in from either end. The louvres were straight, allowing the air to be forced from the north wall directly across the ceiling toward the south exposure. At the extreme east end of the room on the north wall was a door opening into the kitchen. In the very center of the north wall was a flight of seven steps leading up to the two bedrooms and bath on the second level.

The furnace was a gas fired highboy. The other eleven homes which were functioning on continuous blower operation heated perfectly, with a differential of only four degrees from ceiling to floor and with the floor constantly at 70 degrees. In this home, however, the two upstairs bedrooms and bath were unbearably hot, and the living room and kitchen just barely got warm and never got rid of a layer of cold air knee-deep on the floor, and this is a crime, even though it's my own.

At that time I believe I was the only advocate of continuous operation and was being criticized very much for it by many experts. This lady in distress kept insisting that if she turned off the blower it wasn't quite as uncomfortable in the house. Now this was a direct contradiction of my theory and belief, and I would have no part of it, and I had put her in the class of a chronical kicker, and she was some class in that class! However, I had just gotten to the point where I was desperate when the solution came to me. I don't believe it is fair from the information I have given you and from the help you can get from the diagram, to ask you to hazard a guess as to the solution of this crime. However, why should I be fair to you—what have you got to lose, so why don't you try it?

(Please turn to page 152)

Bonus Plan Aids Heating Contractor

R. C. NASON
Long Island City, N. Y.

One of the most perplexing problems faced by the heating contractor is that of retaining his work force intact. One eastern contractor has found that a bonus plan helps him solve this problem.

TWO unusual features are contained in a recent winter air conditioning contract for a group of 100 new homes in Mineola, N. Y. The Long Island Oil & Gas Heat Corp., which made the installations, specified an unusual duct design in some homes heated by warm air which had concrete slabs for floors, in the absence of a basement. The other feature was the use of a bonus incentive plan for its installation crews. This incentive plan has been in the process of development since July, 1947.

There are two separate developments in this job, of slightly differing characteristics. One comprises a number of small homes with basements and also about a dozen cellarless bungalows with a concrete slab floor. Most of the buildings in the other development are of two story design and have full basements.

Most of the details of design and installation practice are standard but there are some innovations that would merit consideration.

Furnace in Garage

Homes without basements are becoming commonplace in this day of skyhigh building costs and it is usual to place the furnace in a utility room or closet. In this particular development, however, the furnace is placed in a niche in the garage. Before the internal siding is erected, the garage and this furnace niche are insulated with aluminum foil on top of which panels of perforated insulation are laid. The garage floor is at the same level as that of the house.

Two duct sizes were used on the job, 12 in. and 8 in., and the actual ducts were sections of 18 ga. round, galvanized pipe. The floor panel was made up of 8 in. of gravel under 6 in. of concrete and the ducts were positioned in the gravel so that two inches of concrete would be above the duct top after pouring.

The bottom sector of the ducts, in the gravel, was insulated with roofing paper and bitumastic but the top part was left uninsulated. The desired result is the radiation of heat from the ducts into the concrete slab to produce a panel effect. These jobs are actually experimental and warm air is still discharged into the room through baseboard registers.

Details of the bonus plan used on these jobs are of interest because the plan is an unusual application of incentives. After an initial period of working out some of the bugs in the original plan it is now popular with the mechanics and also of benefit to the company.

The mechanics who handle the installation of ductwork do so in two man teams, one a mechanic and one a helper. These men do no shop work nor do they set the heating units. Their only job is to erect ductwork and they are paid wages that compare favorably with going rates in the area. Of course, this team setup is by no means unusual but the management of the company came to the conclusion that such teams have a tendency to work a little slower than the job allowed cost would permit. Thus, last year when the orders began to pile up, good men began to get scarce and this additional factor of productivity was under consideration, the bonus plan was developed.

The first step in setting up the incentive plan was to refer to past costs in order to estimate what erection costs should be for average contracts. Management was then able to arrive at a cost figure and the number of manhours of labor needed. A cost per opening was then calculated on the basis of these figures. Some additional factors that enter into consideration are construction obstacles and distance of the building from the shop. The latter is important because the men are paid from the time they leave the shop until they return.

How Bonus Works

Some specific figures on a job should serve to demonstrate the way the plan works. When the construction of the house has proceeded to a point at which the heating plant can be roughed-in, all ducts and fittings for the job are assembled. For an example, let us take an installation that has 25 openings and has been figures at 125 hours of labor and a theoretical labor cost of $10.00 an opening. This is the figure that the crew has to beat. By stepping up their speed the men may be able to do the job at a labor cost of $175.00. The difference between the estimate and the actual cost ($75) is then credited to the crew as a bonus.

The bonus is not split evenly but since the crew consists of a mechanic and a helper, the mechanic may get two thirds and the helper, one. Bonuses earned are paid at the same time as the weekly wage earnings.

Last July the plan was started on an experimental basis but it has worked out so well that practically all jobs are handled this way. Only about 3 per cent of the total work is not installed on an incentive basis and that percentage is the result of construction difficulties.

A single crew of two men is usually assigned to one building to make the installation. Sometimes it may

This is one of the slab floor homes that is described in the text.

become necessary to speed the work or the job may be unusually large and several crews might be assigned to the same job. Then the job of the bookkeeper becomes a bit more complicated since the company pays its help on a basis of experience and ability, and the bonus is divided according to wage rates.

Installing aluminum riser in one of the two story homes in the project.

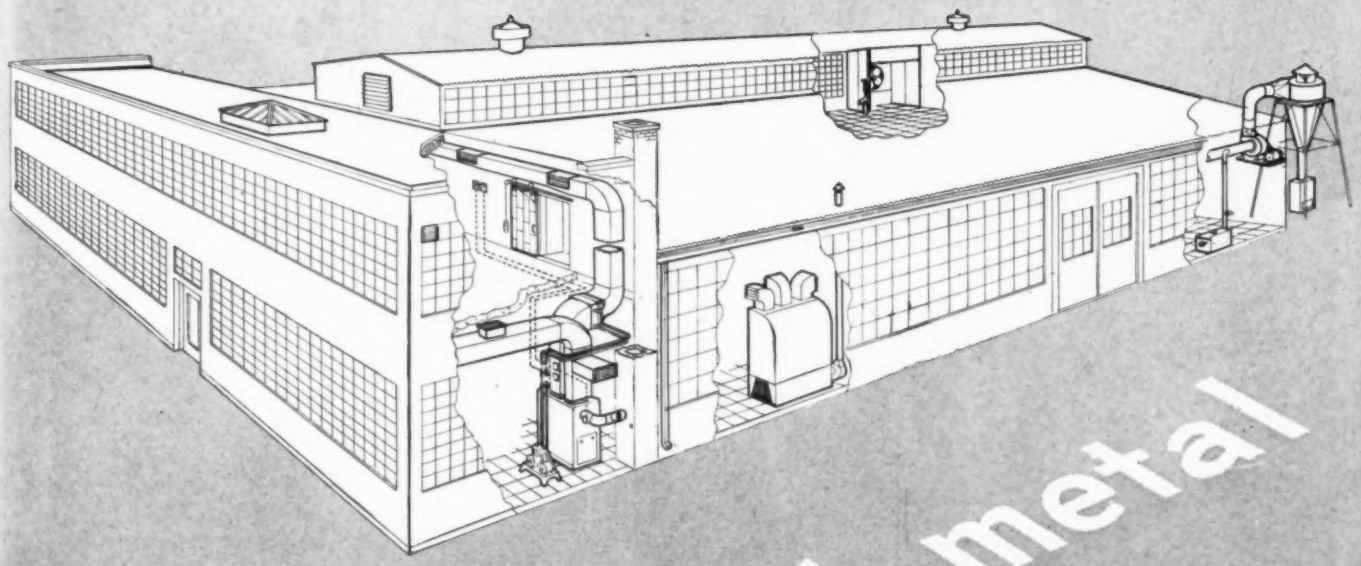
It sometimes happens that the installation crew cannot erect the ductwork in the allotted time. In such a case the company stands the loss. This is charged against general net profit and not against the mechanics. There may be obstacles in the erection that prevent finishing the job in time. One such obstacle crops up occasionally when the carpenters fail to cut out register openings. Labor restrictions make it impossible for the sheet metal workers to cut these out themselves; they can only mark them. Usually the crew is able to go to a house nearby where the openings have been prepared and do their work there. Thus, the time lost is only that of traveling from house to house.

Does It Help the Contractor?

How does the contractor benefit from this incentive plan? There is a shortening of labor time, perhaps as high as 25 per cent and yet this money saved is paid to the crews as a bonus. The benefits lie in the fact that the incentives make it possible to keep the working force intact and as the crews work together they are able to cut their time and raise their efficiency. Thus the contractor is able to complete more jobs with a smaller force and an increase in volume with the same working force means an increase in profits.

The speedy installations made possible by the incentive plan please building contractors and home builders and help relieve the housing shortage by cutting down the time required for one important phase of residential construction. By the automatic elimination of gold-bricking on the job, field supervision is minimized. The crews are also aware that their work must be done correctly, for if a return has to be made to a job that was supposedly finished the additional charges cut the bonus.

The overall result of the incentive plan is threefold: it enables the home builder to get into his house more quickly, at no extra expense; it raises the earnings of the workers, the harder they work the more they earn; it enables the heating contractor to increase his volume without increasing his working force and thus increase his profits.



sheet metal *Section*

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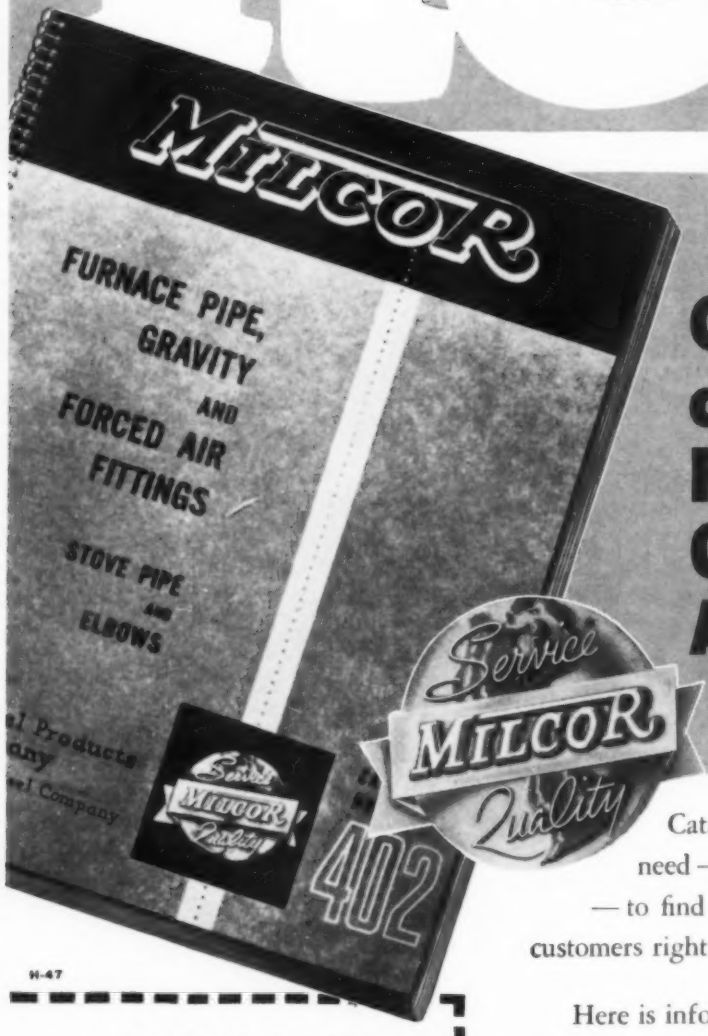

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Daughters of the American Revolution Memorial Continental Hall

Here's A Copper Roof— Good 'Til 2048 A.D.

LAWRENCE E. GICHNER
Gichner, Inc.
Washington, D. C.

The author firmly states that a properly installed copper roof should last for hundreds of years. His analysis of a roof failure, given here, is worth study.

ONE of the major show places of Washington is Memorial Continental Hall of the Daughters of the American Revolution. An imposing structure of marble and white columns, it is visited yearly by thousands and gazed down upon daily by many thousands more from the top of the Washington Monument. It houses many rooms impressively decorated and expensively furnished with priceless heirlooms donated by members, but its ornate ceilings and irreplaceable contents were being ruined by ugly marring leaks.

A Mere Fifty Years Old!

Inspection revealed that the 16 oz soft copper batten roof was going bad, yet a copper batten roof should give decades of perfect service. In fact, we earnestly believe a batten roof correctly installed should give hundreds of years of complete protection and not go bad in fifty years as did the one on Continental Hall.

When called upon to remedy the condition, we tackled the problem with one thought in mind. What can we do to make a better and more lasting job? To this end we cautiously studied the mistakes of our

Expansion joint installed on high point of gutter

predecessor. It was assumed he had used the best knowledge of his time. But where was his judgment faulty? How could we utilize our present knowledge and construct a roof of lasting quality? How would we benefit by our predecessor's errors?

Fault One

Our examination disclosed that he had used iron nails in tacking his sheets to the sides of the battens. The nails had rusted away and left holes into which snow and rain had worked their way rotting the wooden battens underneath.

Fault Two

Secondly, and here is where the architect's design proved faulty, a large flat tin deck drained onto the sloping copper roof with a twelve to fourteen inch drop between the two surfaces. Water did not drain evenly along the entire edge where they joined and met, but quite naturally sought out the low areas and dripped in greater quantity at these points. The flowing water carried with it soot granules and dirt grit blown up from the street below and as it dropped, carrying these abrasives, the metal was worn thin and then through.

Fault Three

In the third place, over dormer windows, and there are many on the building, and in the gutters, there were no expansion joints to allow for the extensive movement of the metal caused by exceptionally hot summers and occasionally very icy winters.

Fault Four

Fourth, where metals were joined by solder, the acid had not been washed off, and with time, in spite of washing rains and lingering snow, the corrosive fluids ate through the copper.

(We cannot urge sheet metal and roofing contractors too strongly to use plenty of water to clean the areas

Mitering a sheet on sloping ridge

where they have used acid. This is tremendously important to achieve a lasting job. Rains are not sufficient to wash the surface clean.)

Fault Five

The fifth condition found was caused by uneven underlying surfaces. Low areas in flat roofs had been built up with cement that was not sufficiently smoothed off in finishing and as a result, those walking over the surface helped the protrusions and jagged edges underneath to cut through the soft copper.

Fortified with this data and over sixty years continuous experience of installing copper roofs, Gichner, Inc. tackled the job of installing a copper roof that would do competent service for many years longer than the one they had removed. To this end they used hard copper instead of soft and they made the copper 2 ounces heavier (18 oz) than recommended by today's standard practices.

Rotten battens were replaced with new but here it is interesting to note that the battens were put on upside down when originally installed on the building. The narrower wedged side which should have been at

the bottom to allow room for the copper sheets between the battens to expand had been put at the top. To change all these battens about was considered too major a job since the expense involved would not compensate for the benefits received.

On cold days it was found that condensation under the copper was sufficient to form ice and cause quite an area of lumps. In order to blunt any sharp edges and act as an absorbent for the condensation, a building paper was installed under the metal.

No feasible solution has been found for the architectural defect which allows a span of from twelve to fourteen inches between the flat decks and the sloping batten roofs. A number of ideas have been adopted to permit the water to slide from one surface to the other but all allow some element of drip. Expansion joints were provided at the gutters on the dormer roofs and in valleys.

Should copper roofs go bad in less than fifty years? *Hard facts answer that they do.*

Dressing down the batten cap

Contractors may honestly believe they are giving a customer a life time covering when they sell them copper but too many failures are being found that indicate otherwise.

Why Failures?

What is to blame for the failure? Is the sheet manufacturer misrepresenting his product? Is the architect using bad judgment in specifying copper? Is the contractor erring in his method of application? Frankly, all these persons, manufacturer, architect, applicator, can definitely help to correct existing errors and make of this superior metal a superior roof for long lasting performance.

Economy Roofs?

Just before World War II, many 3 and 10 oz "economy roofs" were sold. The three ounce roofs were backed up with paper. A good number of these three ounce roofs were sold in Florida. On a trip to the sunshine state, I visited a number of my colleagues in the profession. On the way to their shops I noticed some roofs in a frightful state of dilapidation. They looked like nothing more than black paper with intermittent spots of peeling scales. I was told the black paper was all that was left of a surface once completely covered with copper. The 3 oz copper had pulverized and vanished in an amazingly short period. And this had been sold to customers as a lifetime proposition.

In my own area around the national capitol I have had frequent occasions to observe 10 oz copper used in valleys and flashings in connection with composition shingle roofs. I frequently found the metal cracked, torn and curled causing devastating leaks.

As in life, so in the roofing business, there is no one panacea to cure all ills. A copper batten roof has many advantages and past performances to recommend it for endurance, but careful planning must be used in its application to avoid unnecessary failures.

Locking on the batten cap to the butt end

Surface Preparation For Painting Galvanized Steel

RICK MANSELL
Process Engineer
Los Angeles, Calif.

In a previous article, the author discussed the way in which paint behaves on galvanized steel. Here he takes up the matter of the proper pre-treatment before painting galvanized steel to get the best results in appearance and sturdy finish. Photos used in this article were furnished by Armco Steel Corp.

FOR many years the commonly accepted methods for the pretreatment of galvanized steel sheets involved such processes as acid etching, weathering, mechanical roughening, and metal deposition. During the last decade, there has been the introduction of the type of chemical treatments which result in the formation of an inorganic film over the surface, a notable example of which is the Bonderizing process.

There is also the method of applying an adherent, jet black oxide finish to the zinc coating. In addition there are a number of types of factory pretreated galvanized steel sheets available, all of which provide an ideal surface for painting. Before considering the latest developments in this field, it is necessary to familiarize ourselves with the earlier methods since some of these are still useful for many special circumstances.

Acid Etching Methods

Acid etching is the chemical method of roughening the surface. An example of this is the use of one per cent solutions of hydrochloride, sulphuric and nitric acids. A very short immersion time is necessary, for there is a danger of the acids dissolving off some of the protective zinc. These methods are fairly cheap and speedy in operation. Some chemical reaction compounds are produced, however, which are not easily removed from the surface and these can do a great deal of subsequent damage.

A better type of acid etching solution is obtained by using a one to three per cent solution of phosphoric acid. This will require ten to fifteen minutes at room temperature, and a shorter time if hot solutions are used. With phosphoric acid the danger of over-etching is small but there is a tendency for it to miss small areas. As a result of its action a protective film of zinc phosphate is formed over the surface. After etching, a thorough washing is used to remove the water soluble salts.

Whenever acid etching is used, it is necessary that the surface be cleaned thoroughly before the treatment, because any greasy areas will resist the penetration of the acids. There is a solution which can be applied by a brush and which will cut grease in addition to etching the surface. It is composed of 60 volumes of denatured alcohol, 30 volumes toluol, 5 volumes carbon tetrachloride and 5 volumes of concentrated hydrochloride acid. The brush used must have a rubber ferrule (acids will attack the metal ferrule) and its bristles must be free from oil. After the surface has dried, it is well cleaned.

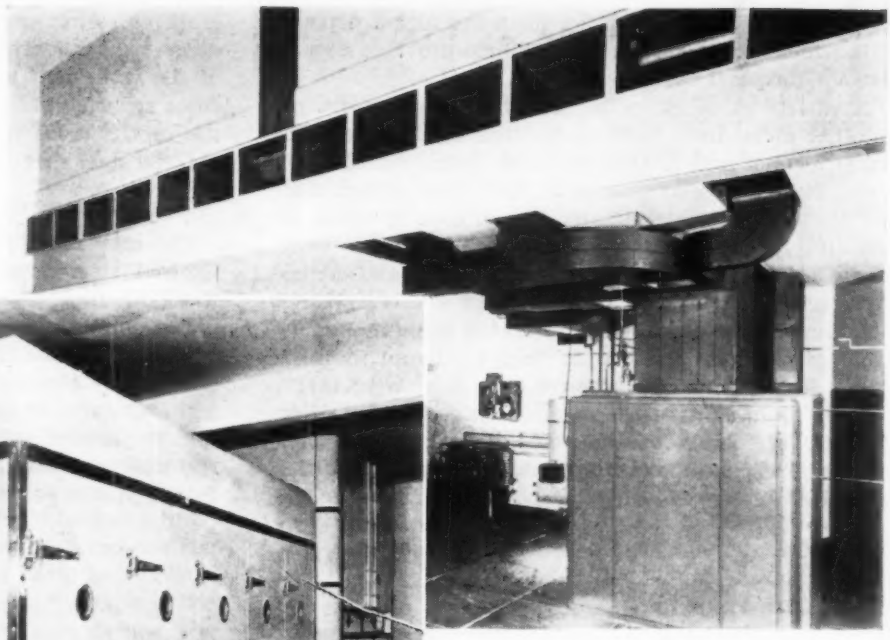
Natural Weathering Methods

The weathering of galvanized steel sheets was long prescribed by the United States Navy as a suitable treatment before painting. The usual recommendations were a natural outdoor weathering for three to twelve months. Some building contractors followed the practice of permitting galvanized structures to weather for two to six months before painting. The time required is uncertain, because in some climates an exposure of one month is sufficient to produce the required type of surface, while for milder external conditions, a longer period is necessary.

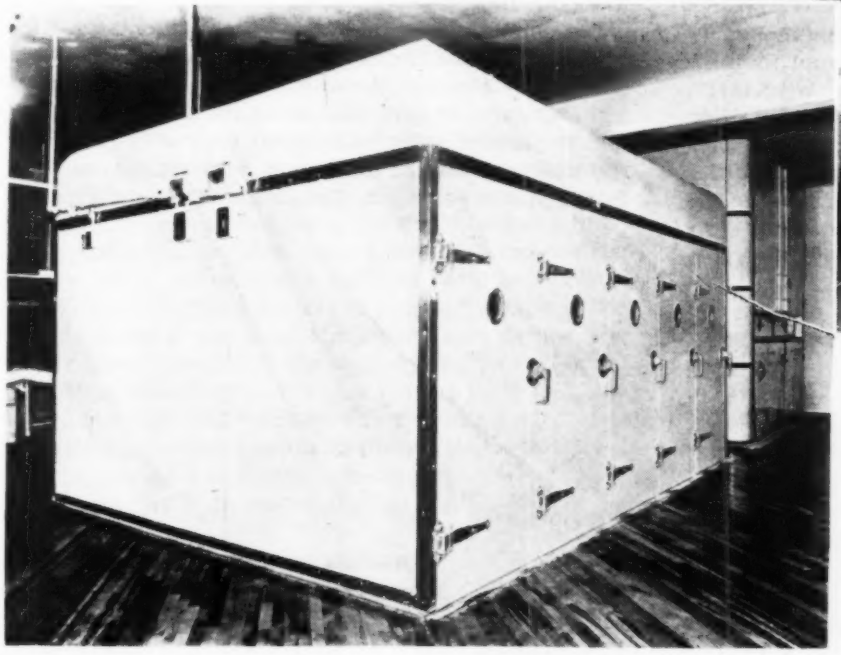
This method suffers from the disadvantage that all sides of the structure will not be equally weathered. The action of air, rain water and carbon dioxide produces a surface roughness which does greatly improve the adhesion. However too much weathering will wear away the surface and so reduce the effectiveness of the zinc coating to protect the sheet steel. In fact, in such environments as marine or industrial atmospheres, chlorides and other soluble zinc salts are formed, and these are washed away continually. In the course of time the zinc coating is eroded.

Mechanical Roughening Methods

The mechanical roughening methods include sanding, wire brushing and emery grinding. Best results are obtained by blasting with steel grit or with sand since the surface is cleaned as well as roughened. The total amount of new surface created by a fine grit is



The ductwork on the furnace at right is fabricated from a special paint-holding sheet.



The ovens at the left were made for the U. S. Government by a New Orleans fabricator of the same sheet as above.

much greater than that from a coarser grit, and hence a better anchoring for the paint film is obtained. The pressure used must be lower than that employed for cleaning the usual steel structures, since the zinc is a softer metal.

The function of all these treatments is to roughen the surface in some way and hence they do provide a better surface to hold paint coatings than that presented by the smooth galvanized metal. It was previously pointed out (August, '48, AA, Page 107) that the main cause of paint peeling from galvanized surfaces was the existence of a chemical reaction between the zinc and the ingredients of the paint coating.

The roughening does help the paint to hang on to the metal surface for a longer time but it does not prevent the final effects of the chemical reaction. To prevent this, it is necessary to change completely the nature of the top surface. This explains the growth of the metal deposition methods, in which the surface of the zinc is plated by another metal which does not react chemically with the paint film.

Metal Deposition Methods

The deposited metal produces a surface to which paint films adhere in a satisfactory manner. The zinc surface is plated by a simple chemical reaction with a solution of the salt of another metal. Copper salts are the most popular in this category. The copper is replaced from its solution by the zinc and the reduced copper is deposited upon the surface. Solutions of such copper salts as the acetate, chloride, and sulphate have been employed at concentrations varying between six and eight ounces per gallon.

A popular solution used contains eight ounces of copper sulphate and five cubic centimeters of nitric acid per gallon of water. It is applied by brushing or wiping and is allowed to remain on the surface for about thirty to sixty minutes. After the deposit of copper is plated out, the surface is thoroughly rinsed and scrubbed with cold water, and then rinsed with hot water. It is important that all the loose, black sludge be removed before the paint is applied. Sometimes a solution of mixed salts is found to be preferable. An example of this is a composition consisting of two ounces each of the following ingredients, copper nitrate, copper chloride, ammonium chloride and concentrated hydrochloric acid, all dissolved in one gallon of water.

Salts of antimony, nickel, cadmium lead and arsenic have all been marketed under different trade names at various times, in the attempt to overcome some of the disadvantages of the copper methods. Solutions of antimony are among some of the oldest etchants. Another product on the market consists of a solution of nickel sulphate, zinc sulphate and sulphuric acid. The acid dissolves off the adherent protective film on the surface of the zinc, the nickel sulphate reacts with the zinc to deposit a thin film of metallic nickel, and the zinc sulphate acts as a buffer to slow up the action. When sodium sulphocyanide is incorporated into the solution, the free acid reacts with it to form hydrogen

sulphide and this in turn converts the nickel deposit into a nickel sulphide compound which provides a good surface for paint coatings.

A variety of solutions based on the plating out of another metal have been used—some of these contain butyl alcohol and phosphoric acid. Solutions of cadmium have also been used, as in the following formula: 6.5 per cent sodium sulphate; 6.5 per cent ammonium nitrate; 1.5 per cent cadmium chloride; 7.5 per cent nitric acid; and 78 per cent water. Some authorities have recommended the application of a silver nitrate solution while a few have investigated the use of solutions of platinum chloride, all in the attempt to overcome a rather difficult problem.

Paint failures have been consistently recorded after the use of metal deposits over the galvanized steel sheets. This may have been due to the fact that the deposited metal was not obtained in a thick enough film to act as an insulator from the paint coating. The deposit was gradually absorbed by the zinc, forming a zinc alloy on the surface and this attacked the components of the paint, in the same way as pure zinc performs (it is interesting to point out in this conection, that brass which has been electroplated over zinc has been known to disappear after a period of several months has elapsed).

A more probable cause of many of the failures is the fact that the surface was not washed sufficiently thoroughly to remove the water soluble salts left behind. The deposit may be very loosely adherent and powdery and so has to be well brushed before the paint is applied.

There is always the danger that the minute particles of deposited metal may form electrolytic couples with the zinc and this would accelerate the formation of objectionable reactive zinc compounds. Since many of them are considered to be electrolytically nobler metals than the zinc, there is always the possibility of the introduction of galvanic couples which would accelerate corrosion. Again the adhesion of the metallic deposits is not always of a high order, and the cost of the treatment is usually a little too high. For all these reasons, there has been a vast expansion in the use of the more modern systems of pretreating galvanized steel sheets.

Special Inorganic Films Deposited on the Surface

The most satisfactory methods for pretreating galvanized steel sheets depend upon the formation of inorganic films deposited upon the surface. For example, sodium silicate will react with a zinc surface to form an insoluble film of zinc silicate. A solution which has been recommended consists of 0.5 parts of chromic acid, 2.3 parts of acid zinc chromate, 1.0 part of salt, and 96 parts of water. The acidic component removes the adherent film of metal and converts the surface into a passive condition. This is a characteristic property of chromate solutions which have also been recommended for steel and cadmium surfaces.

Here is a home which has been made more attractive by the use of steel siding treated to hold the paint.

An alcoholic solution of phosphoric acid will cut through a thin film of grease and will flow readily on the surface. A chemical reaction will produce a film of zinc phosphate and this will provide adequate adherence for the paint coating. A very satisfactory proprietary phosphate treatment consists of a hot dip in an aqueous solution of zinc phosphate containing free phosphoric acid as well as an activating agent. In fact this solution is very similar in type to that used for rustproofing plain steel panels.

It is this phosphating process that has become so popular under the name of Bonderizing. In such installations, it is possible to treat assemblies composed of steel, zinc, galvanized steel, galvannealed metal, or cadmium coated metals. The processing time is about one minute and it produces a finely crystalline coating which is chemically inert and increases the adhesion and durability of any applied paint finish. This process is being applied at the steel mills on zinc coated sheets.

The sheet stock is being converted into culverts, eaves troughs, gutters, downspouts, roofing, siding and ductwork. It is being applied to panels for boats, truck bodies, signs, and shower bath cabinets.

In the phosphatizing process the galvanized articles are conducted from the galvanizing bath by means of a conveyor. The articles can be treated while they are in the hot condition, or they may be passed through cooling sprays and etched cold. The galvanizing work may be led through a spray etching tunnel in which the liquids are pumped into sprays located in the walls of the tunnel.

Alternatively in the immersion system the galvanized work is immersed in tanks containing the solutions —the hot articles maintain the tank at working temperatures. The time for the treatment varies from one to two minutes. The work is washed and then rinsed in a chromate solution. The sheets pass through a series of rinses to remove undesirable water soluble phosphates and are then passed through squeeze rolls.

As a result of the success achieved with the Bonderized hot dip galvanized sheet and strip, there came the development of the Bonderized zinc-flash sheets. The cold reduced sheet, as it comes from the rolls, is cleaned and then passed through a zinc plating bath, and this is immediately followed by the Bonderizing process. The greatest advantage of this process is a considerable increase in the fabricating properties of the stock while still retaining high rust-resisting qualities.

Variety of Uses

Due to the thin electrically deposited coating of pure zinc, the zinc-flash has maximum adherence to the steel so that it may be stamped, drawn or bent. It is available in all popular gauges and standard widths and lengths, with strip in coils. It is suitable for products which require little or no forming, such as lithographed or painted signs, metal bathroom tile, and venetian blinds. It has been used for such varied applications as kitchen cabinets, bill boards, truck and trailer bodies, signs, filing equipment, auto license plates, soft-drink cabinets and for airplane sheet metal.

These bonderized zinc-flash sheets are plated with between .00002 and .00005 inches of zinc. They are Bonderized before shipment by being subjected to a hot, balanced zinc phosphate rust-proofing solution, containing nitrate and iron or nickel as an accelerating agent, until a uniform crystalline phosphate coating is formed. This is followed by a rinse in clean water followed by a second rinse in dilute chromic solution and then drying.

Careful Handling Needed

The sheets are stored in a clean dry place. They are adaptable to most forming operations, but deep scratches should be avoided. The adhesion of the zinc film is such that it will not flake, peel or powder in the forming dies. Select a drawing lubricant which may easily be removed and which does not contain a large percentage of inert material.

The sheets can be soldered easily when properly fluxed. A good mixture consists of equal parts of raw muriatic acid, cut acid, denatured alcohol and water. In spot welding, a higher voltage is needed since the phosphate film is a non-conductor and acts as an insulator. Satisfactory results are obtained with a 3/16 in. diameter spot, using 250 to 300 pounds pressure on the electrode.

Bonderized zinc-flash sheets may be metallic arc welded, carbon arc welded, or oxyacetylene welded, although the heat does tend to weaken the protective efficiency of the coating next to the weld. After soldering and welding, the joints may be cleaned taking care to remove as little as possible of the phosphate coating. If desired these areas may be spot-patched using a phosphate solution.

Final Cleaning

If the sheets accumulate foreign matter during shipping, handling, or fabrication, they must be cleaned before painting. A dilute alkali, ⅛ to ½ oz. per gallon, can be sprayed on, and followed by a hot water rinse, and then a hot dilute (2 grams per gal) chromic acid rinse for 30 seconds. Alternatively a trichlorethylene degreaser is used followed by the hot dilute chromic acid rinse. If the drawing compound contains inert material, the articles should be spray water rinsed after the degreasing and before the chromic rinse.

Wiping with solvent is satisfactory but does not provide as high a corrosion resistance as the two preceding methods. Wiping should be followed by a chromic acid rinse, if possible. Picking acids or strong alkaline cleaners are not recommended for preparing Bonderized surfaces for painting. In all cases the surfaces must be thoroughly dried before applying the primer.

The phosphate film must be continuous over the surface of the galvanized steel in order to maintain its effectiveness as a corrosion retarder. Scratches or other surface breaks reduce its value. For this reason a good painting system is necessary. The primer used should be as water resistant and rust inhibitive as possible.

Final Finish

A zinc chromate-iron oxide pigmented vehicle consisting of either a phenol-formaldehyde, tung oil type or a phenol modified alkyd resin, is a very good type of primer. Because of temperature changes resulting in the contraction and expansion of the metal, the paint must not only stick on, but it must also remain elastic. Aluminum type top coats have been found to be very durable. If lacquer is to be used as a final finish, then an oil base primer should be used as a ground coat. Baked synthetic enamels give good results, but it is best to hold the temperature below 450 F.

It is very fortunate that the producers of galvanized steel products have recognized the troubles that the finisher experiences in the painting process and are supplying factory pretreated products. One such product is annealed in the process of manufacture to produce a rough matte surface. This galvannealing process involves the reheating of the galvanized zinc to a temperature of between 450 and 600 C. It cannot be done in the air because of the formation of a loose deposit of zinc oxide which would reduce the adherence. For this reason a fused salt bath is used; the article passes from the zinc bath to the salt bath and then to a water quench to remove any adhering salt.

The painting characteristics of such galvanized surfaces are much more favorable than the smooth span-

(Please turn to page 164)

Scientific Shop Layout (II)

E. E. ZIDECK

Sheet Metal Consulting Engineer

The second of a new series designed to bring the latest in shop layouts and techniques for efficient production to our readers. The author's experience in sheet metal design and production has enabled him to show step-by-step the way in which a sheet metal shop can be made to operate most effectively and economically

IT WOULD be a rather serious error to associate work management only with factories or shops employing large numbers of men. If a man has a sheet metal working shop that claims only one employee, himself, there are certain procedures that would have to be followed in any job. These preliminary steps include procurement of materials and supplies, workspace to perform the necessary operations and the acquisition of the tools that may be needed in the work process.

If these things are done as a preliminary to the actual performance of the work, that work will be facilitated by what has gone before. Work management, then, is taken to mean the above described steps in organizing the job for the man or men who are to perform it. If the work is systematized to a point that they will always have materials, tools and accessories instantly available their productivity should be at an optimum level.

Work Management Defined

In this article work management is taken to be the intermediate stage between engineering of the product and its actual production. It carries out the plans evolved by the engineering phase and facilitates the execution of the production phase. There are a number of aspects to work management. It involves:

(a) making available to the production departments the materials, rough or finished, which are required.
(b) supplying the tools that are required in the various stages of production.
(c) materials handling, moving raw material in, moving the work from step to step as it is in process.
(d) planning the operations required in production, that is, analyzing the blueprint to determine the the most efficient tools to use and method of making the product.
(e) Analyzing the tooling needs to determine whether existing equipment will be adequate or new machines will be necessary.
(f) analyzing the shop layout to determine whether any rearrangement is needed.
(g) judging the requirements in regard to the labor force, as to whether new help might be needed.

The exact requirements set up by the production process will differ with each shop, but the essentials listed will hold true whether they are formally followed or just performed without any definite planning. They will apply regardless of the nature of the shop, whether it is engaged in architectural or industrial sheet metal work; heating or ventilating; air conditioning or custom fabrication.

Custom Sets Routine

Where the shop has been more or less standardizing on one particular product through the years the principles of work management have gradually been set up, by custom if not design. But if there should be a major change in the type of product handled, these various phases will immediately become important to correct practice. They are always recurring in the sheet metal shop that handles architectural work or air conditioning, for generally each job differs at least slightly from its predecessor. Many industrial sheet metal shops, likewise, find it advantageous to apply the principles of work management. They may handle products that fall in the same general class, and yet differing dimensions may require changes in production procedure.

Shop layout is a function of work management and it is logical to assume that any sheet metal shop turning out a product or products on a production basis would plan its layout to conform to the needs of the greatest number of such products.

In these shops it may not be possible to group the raw materials and bulkier equipment as shown in the accompanying drawings, but it is obvious that the material bank should not be located any great distance from the tools for shearing and blanking. Where the process of production requires the incorporation of various parts, it is obviously advisable to keep these parts in a location that will enable the workers to secure them easily.

Assembly and finishing are two departments that offer a certain flexibility in arrangement in the shop. Final assembly frequently entails the use of portable tools and likewise often does not require fixed or permanent benches. Depending on the type of product it may not be necessary to allot any space at all for product finishing.

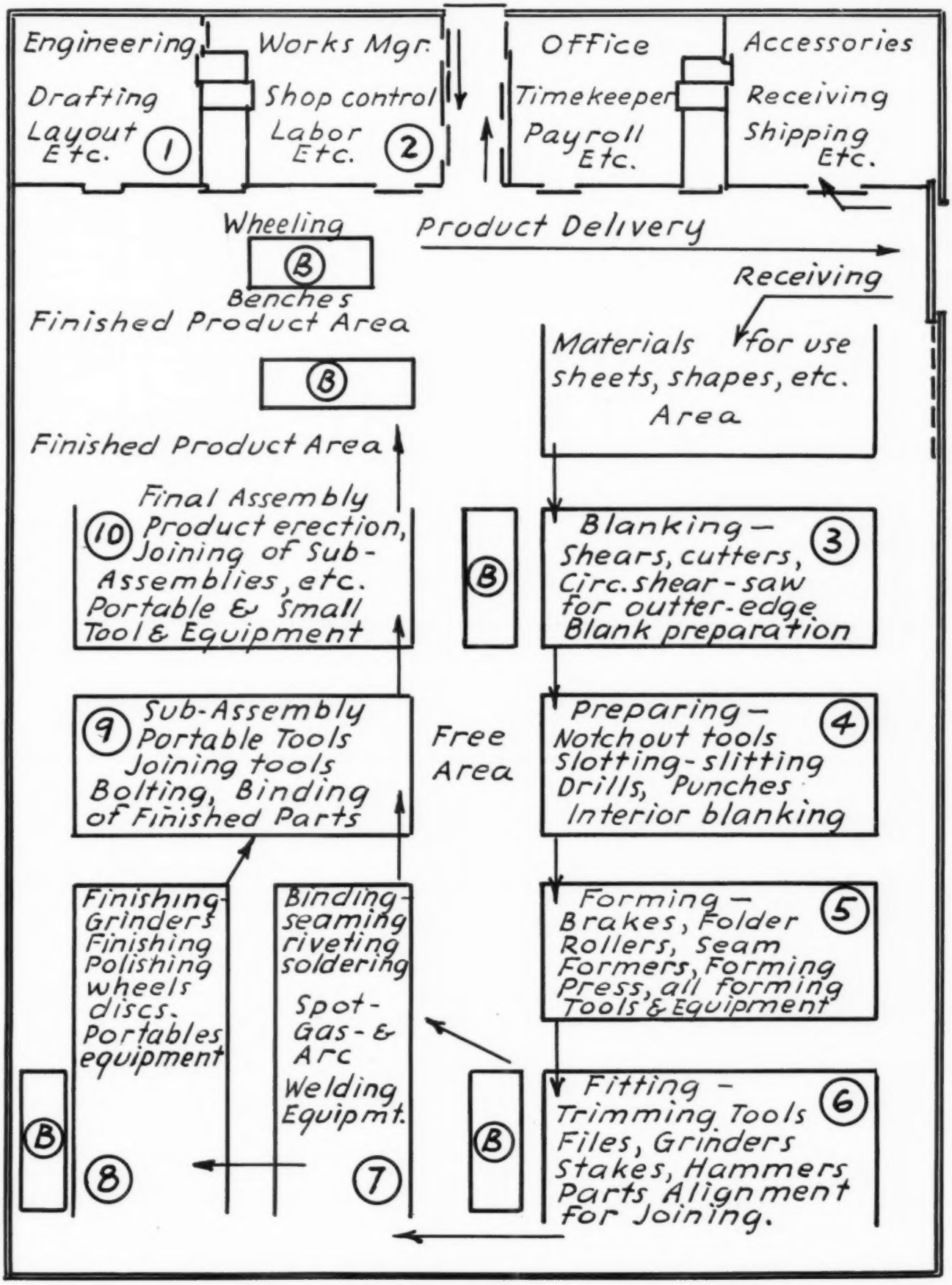

Engineering
Drafting
Layout
Etc.
1
Works Mgr.
Shop control
Labor
Etc.
2
Office
Timekeeper
Payroll
Etc.
Accessories
Receiving
Shipping
Etc.
Wheeling
B
Benches
Finished Product Area
Product Delivery
Receiving
Materials for use
sheets, shapes, etc.
Area
B
Finished Product Area
Final Assembly
10 Product erection,
Joining of Sub-
Assemblies, etc.
Portable & Small
Tool & Equipment
B
Blanking —
Shears, cutters,
Circ. shear-saw
for outter-edge
Blank preparation
3
9 Sub-Assembly
Portable Tools
Joining tools
Bolting, Binding
of Finished Parts
Free
Area
Preparing —
Notch out tools
Slotting-slitting
Drills, Punches
Interior blanking
4
Finishing-
Grinders
Finishing
Polishing
wheels
discs.
Portables
equipment
Binding-
seaming
riveting
soldering
Spot-
Gas-&
Arc
Welding
Equipmt.
Forming —
Brakes, Folder
Rollers, Seam
Formers, Forming
Press, all forming
Tools & Equipment
5
B
8
7
B
Fitting —
Trimming Tools
Files, Grinders
Stakes, Hammers
Parts Alignment
for Joining.
6

Fig. 2 Sheet Metal Shop: Rear Entrance

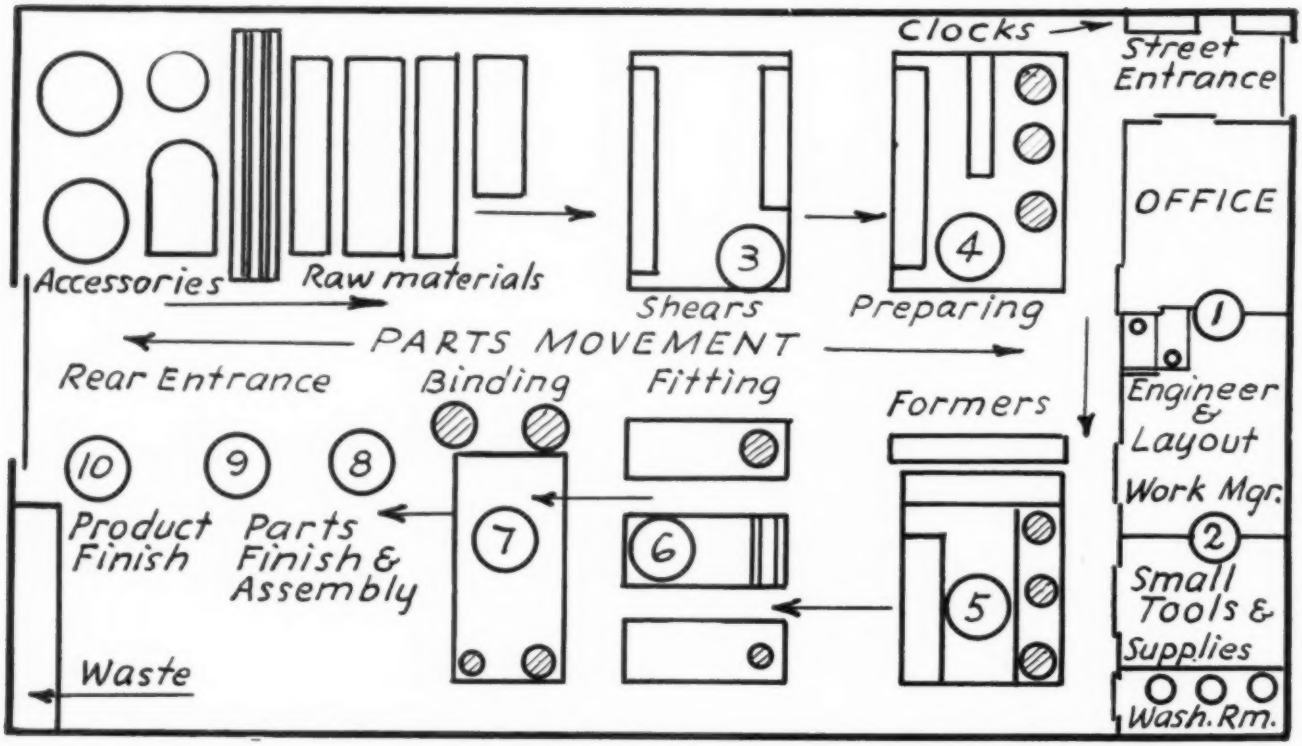
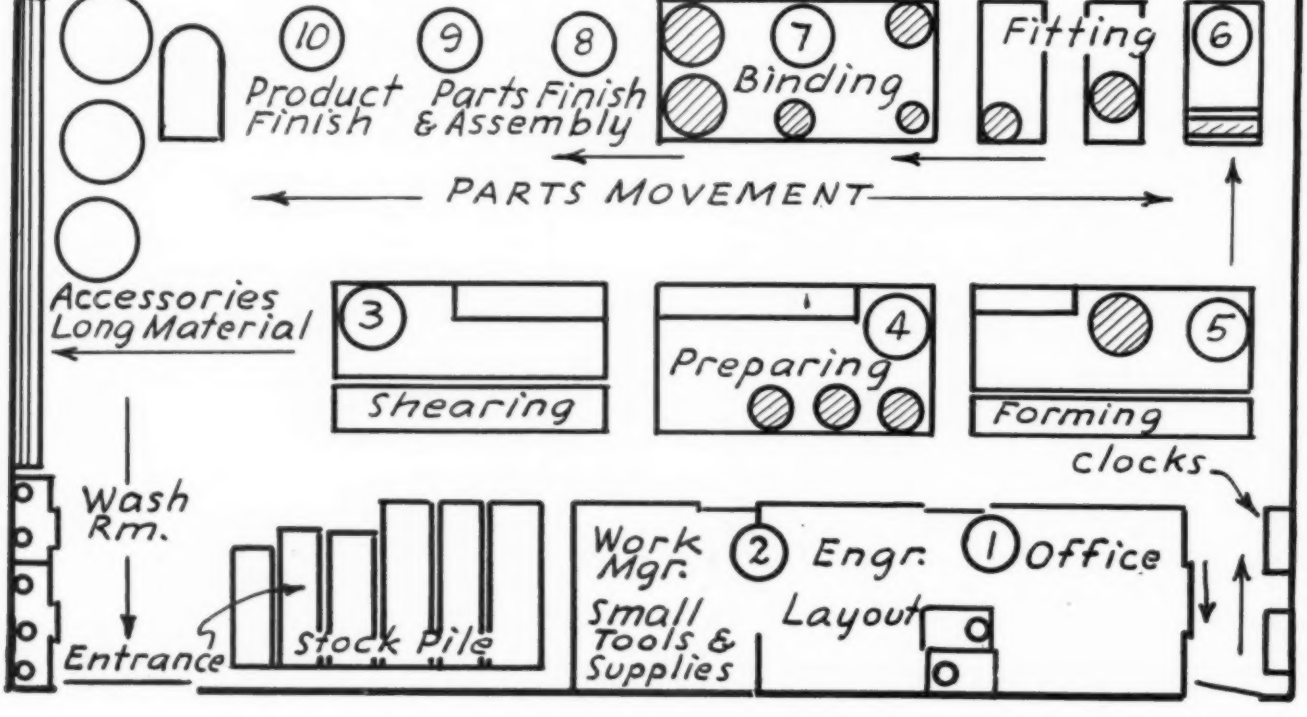


Fig. 3 Sheet Metal Shop: Long Side Entrance



A large percentage of sheet metal shops receive materials and bulky accessories in the rear of the shop with the front portion of the building occupied by offices and storage space. In these cases it pays the shop to have its tools and machines of category 3, (shearing-cutting-blanking) next to the materials storage, which should in turn be located where the materials are received. The order of the departments shown in the drawing is then reversed: Blank-Preparation adjoining category 3, Forming adjoining category 4, and Fitting being near category 5, when it receives its parts to be fitted. Should the materials delivery be at the side of the building, the arrangement of the departments would be governed accordingly. These eventualities of shop arrangements are sketched under Figures 2 and 3 of the drawings.

Layout Must Be Flexible

We should not position machines, tools and means (benches and such) where they are of no use (or might be used only once in a long while). Under Category 3, should be grouped shears and cutters for raw materials only. Instead of benches we should use shop trucks (benches of desirable sizes provided with casters). From such traveling benches we then pick up the material to be sheared or cut to size, and deposit the parts upon another such bench. Where long sheets are cut across, we can use one of the traveling benches for supporting the sheet in the rear of the squaring shears. These traveling benches may be used to advantage, whether we do shearing by strip-shears or electric shears also. It might pay to provide legs for these benches which could be lengthened or shortened to suit the heights of the different machines, or for hand work done upon the benches. These traveling benches are used for parts and product movements through the shop also.

Inspection Important

In respect to the letter (e), of Category 2, it is a rule of efficient sheet metal work that we inspect the detail drawings and specifications of each single part before we start cutting up the materials. Errors are possible (and do happen) in the best of drafting; and then again, for one reason or other perhaps we cannot follow either the draft or the specification. These matters should be adjusted before the first step in production of the particular part. Inspection of each step in production saves trouble and money. This inspection may be done by the workman himself, by the foreman, or by a specially employed inspector (familiar with sheet metal work and with the drawings and specifications). If the blanks coming from department 3, are correct (each of the same prescribed size and material), then the next operation (blank preparation) will result as specified, provided however, that this step also is inspected and its correctness ascertained. The above applies in the same degree to the work of the next department (Forming). The successive departments (Fitting, Binding, Assembly, etc.) are either swift with their work and the product is good; or the reverse; all depending on the foregoing inspection. Haphazardly sheared and prepared blanks result in discrepancies in their formed shapes, which it takes much effort and time to fit together; and a bad fit of the parts obviously results in a poor product.

We have broadly alluded to the phases of the letter (g) of the category, especially so in respect to the shop and to its arrangement for production. Work management applies specifically to production with means at hand. It is rational to expect work to be done with means with which countless other work of that same nature has been done in the past. And it would be a poor manager who could not condition the shop and the available means to do the work again and again.

Workers Depend on Tools

But here arises a problem under letter (h) of the category: *available mechanics or labor.* In the olden days there were sheet metal mechanics who understood sheet metal products sufficiently well to lay-out and process parts through all operations, doing it with scant or poorly performing machines and tools. Their knowledge and their skill enabled them to supplement the inadequate machine or tool performance by hand work. This ability in the sheet metal worker is more and more on the wane. The newer crop of workers are more versed in blue prints and doing work to specifications, but they require machines and tools for each single phase of the operations, the operations being then perfect in themselves and calling for a minimum of manual adjustments.

Automatic Machinery Helps

It is with this consideration in view that we peruse the manufacturers' catalogues or advertisements displaying newer machines and tools, wondering about their performances and whether such tools might not prove of a lesser cost to us than is the growing inability of the help to produce efficiently (in a manner spelling profit to us), by what we already possess in tools and machines. It is undoubtedly true that a squaring shear with gauges for adjustments of the width of the sheared strip is better than doing the shearing by measurements, markings, and with a hand or a bench shear. And if we have such a shear taking in lengths required for our work, we can cut up the materials in it, accurately to size, in about one hundredth of the time that would be consumed doing the work by hand. What applies to the shear, applies to other new and improved machines also. Doing work with these newer means, we don't require all around sheet metal mechanics; the performance results in a more correct part or product; and the saving in time is immense. The question arises: which tools and machines would be of the utmost benefit in our specific work?

● An important aim of this series is to bring up topics for discussion, since it is obvious that there is no single layout that will fit all sheet metal shops. If any of our readers have special problems in regard to efficient shop layout Mr. Zideck will be glad to advise them, if they will send us details of their difficulties.—Ed.

Ventilation of Welding Fumes

Here is a practical problem in exhaust ventilation that arose and was solved by the contractor. You may meet similar cases.

PAUL R. JORDAN

Indianapolis, Ind.

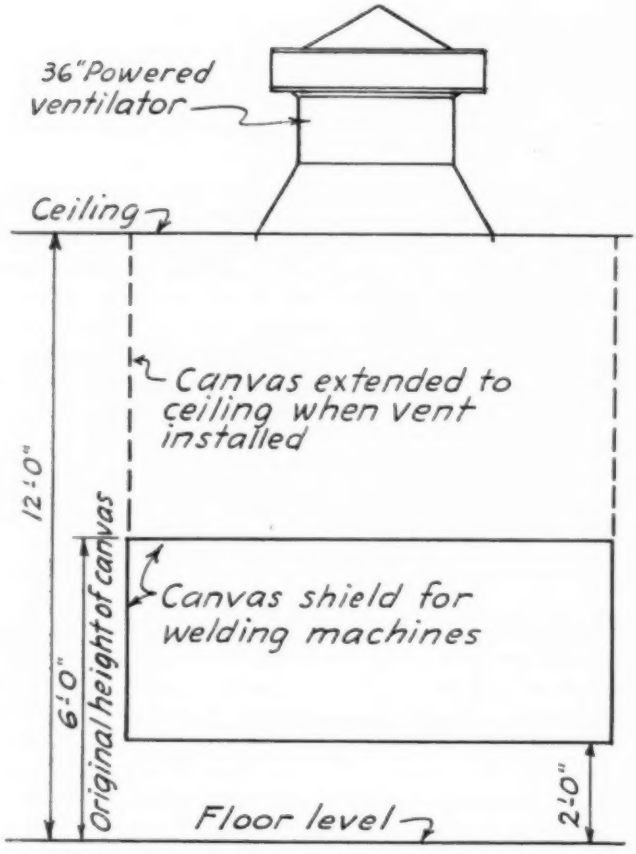
WE were called in to work out a ventilation problem caused by welding fumes in an industrial plant. In a large room we found a group of a dozen welding machines surrounded by a canvas shield about 40 ft x 40 ft. The shield began 2 ft above the floor and reached a height of 6 ft. There was also another canvas enclosed group in the same room, the second being about twice the size of the first. Apparently, these shields were inadequate since welding fumes were entering the remainder of the room.

Reason For Fumes

It was quite evident that the reason the fumes were leaving the canvas shields was that there was no provision for exhaust. It is a simple matter to arrange to exhaust the fumes in such a case, but the problem should not be handled without study. The amount of exhaust must naturally be kept down to a minimum, because of heat loss, as well as the expense of installation and operation of the exhaust equipment. In this instance the addition of exhaust equipment with no alteration in the canvas shield would cause air from the entire room to flow across the ceiling over the canvas and out the exhaust. By continuing the canvas up to the ceiling, this air would be blocked, making the entire exhaust effective for the purpose for which it was intended. We calculated that one 36 in. direct connected fan ventilator would handle this job. It would certainly be adequate unless cross currents within the room upset our figures. Now let us see how this would work out.

Hood Dimensions

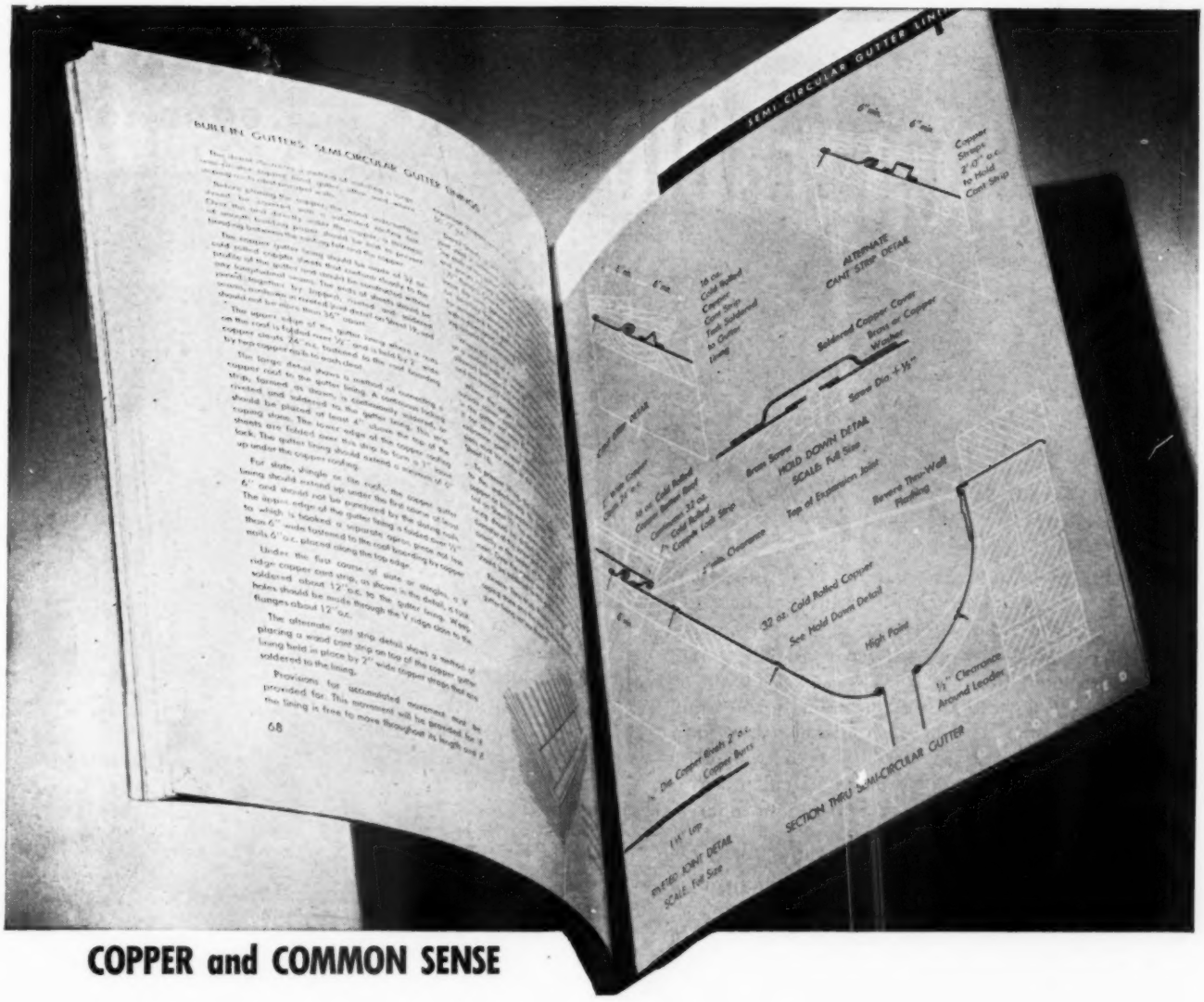
This canvas enclosed space was 40 ft by 40 ft, or 1,600 sq ft with a 12 ft ceiling, a total of 19,200 cu ft of space. One 36 in. fan ventilator of 15,000 cfm capacity would give one air change in about 1-1/3 minutes. This seems high if the area is considered as a room, but actually about the same characteristics exist in this canvas enclosed space as exist in a hood. It has intake on all sides like a hood, which a room does not have. The 160 running feet of canvas two feet from the floor results in 320 sq ft of entrance area into the hood. The ventilator specified would give an air flow of about 50 fpm which seems about correct.



Solid lines show original installation; dotted lines addition.

Success of Job

As to just the degree of satisfaction this furnishes will depend on two factors over which the engineer has no control; first the cross currents within the big room; second, how much these particular owners demand in the way of perfection. It is our guess that inasmuch as welding fumes rise and the canvas comes down to within two feet of the floor, cross currents will not carry enough fumes under the canvas and into the main room to be objectionable.



COPPER and COMMON SENSE

QUESTION: What's the best way to install semi-circular gutter linings?

ANSWER: Detail Sheet 19, Pages 68 & 69 in "Copper and Common Sense"

A QUICK SOURCE of reference for busy men, Revere's 96-page book, "Copper and Common Sense" is based entirely on authoritative new data provided by Revere's sheet copper research. The new principles it covers show how stress failures can be avoided through engineering design.

In the few months since it was published, this book has become the standard reference for leading architects and sheet metal experts in all parts of the country. That is because the facts it covers are important to every one concerned with better sheet copper construction, and are presented in the form of large, clear charts that are easy for practical men to use.

Copies of this book are now in the hands of all holders of Sweet's Architectural File, and of leading sheet metal contractors. We urge you to use this book, to turn to it first in all matters of sheet copper construction. It covers every phase of the subject—roofing, gutters, flashing—in full detail. For any further assistance, feel free to call on the Revere Technical Advisory Service, Architectural. Revere building products are sold only through Revere Distributors.

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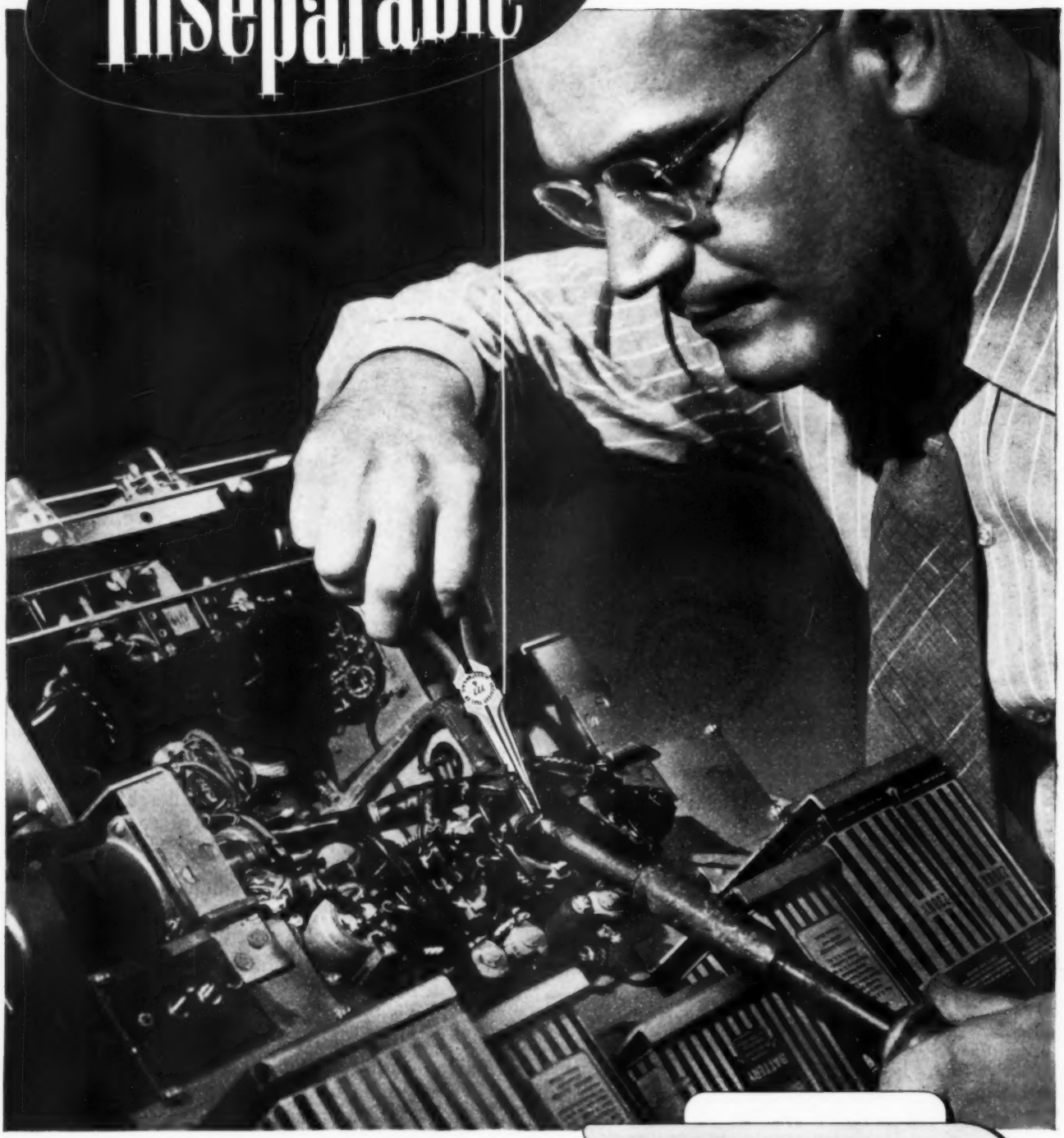

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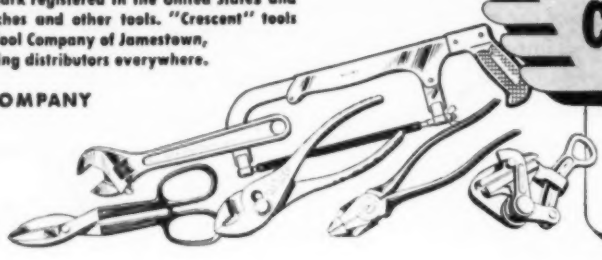
Jamestown, N. Y.



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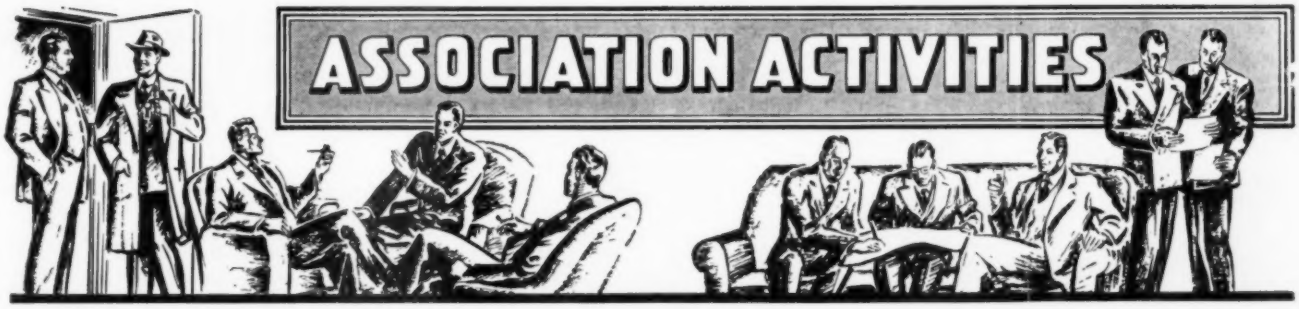
Sign of the Artisan
Symbol of Excellence



Wisconsin

THE thirty-fourth annual convention of the Sheet Metal Contractors Association of Wisconsin, Inc., will be held at the Hotel Schroeder, Milwaukee, on February 6, 7 and 8, 1949.

Exhibitors are already contracting for space and a larger exhibit than in the past is expected.

A. H. LUEDKE

Executive Secretary

Carolinas

THE September issue of "The Carolinas Roofer" published by the Carolina Roofing and Sheet Metal Contractors' Association, carried a picture of the 136 bed emergency polio hospital built at Greensboro, North Carolina. Greensboro roofers volunteered to apply the roofing without charge and all participated. Roofers furnished and applied 350 squares of five-ply tar and gravel roof with two inches of insulation,

One hundred thirty-six bed emergency polio hospital at Greensboro, N. C.

valued at approximately $18,000. Seven tons of heating equipment were flown from LaCrosse, Wisconsin, for this hospital. Citizens gave money, material, or labor—anything to expedite the erection of an adequate hospital. Numerous building material dealers and roofing salesmen's cash contributions helped make this project possible.

The King Roofing and Manufacturing Co., Sanford, N. C. is now equipped for shearing, gang punching and forming mild steel up to and including 7 ga. in 10 ft. lengths. They will handle fabrication of metals too heavy for the smaller shop.

J. A. PIPER

Editor

Canada

THE Technical Advisory Committee of the Canadian Chapter, National Warm Air Heating & Air Conditioning Association, recently completed a study of its educational program in warm air heating.

The dealer education program was initiated in 1947, when seven schools were held across Canada with an aggregate attendance of 288. In early 1948, ten schools were held from coast to coast with a total attendance

Members of the Schnurr and Kraemer staff, Kitchener, Ontario, who attended the 1948 Toronto warm air heating school. Top, left to right: Alf. Durrer, Jim Diebolt, D. Schilroth, L. Kraemer, W. D. Colley, G. Murray. Front row, left to right: L. J. Farwell, Glen Hebel, D. MacKay, P. F. Jolkowski, F. O. Strome, A. H. Weber, J. Kramer. Missing from picture, H. Miehm.

of 431 delegates. It is estimated that approximately 20 per cent of this number were repeat students.

It is planned to enlarge the 1949 schools program to eleven regular schools plus an advanced school to be held in Toronto during the first week in January, the curriculum of which will be based on Manual No. 9 covering buildings of more than 120,000 Btu hour heat loss. Enrollment at this advanced school will be limited to representatives of manufacturer members and associate members who hold a school certificate issued by the association.

At some centers the school program will be advanced from four to five days, and in these cases a day and a half will be devoted to a No. 9 Manual problem design.

Tentative school centers for the 1949 program are Vancouver, B. C.; Lethbridge, Alta.; Regina, Sask.; Winnipeg, Man.; Chatham, Ont.; Brantford, Ont.; Toronto, Ont.; Ottawa or Kingston, Ont.; Montreal,

P. Q. (English); Quebec City (French); Amherst, N. S., or Fredericton, N. B.

The Canadian Chapter has 442 heating contractor members, 28 manufacturer members and 12 jobbers.

At the June meeting of the five members of the Technical Advisory Committee, it was recommended that the Chapter prepare a Master Heating Code covering all phases of warm air heating, to be made available to interested parties. The first draft has been prepared.

A change in the presentation of the school problem house design has been suggested. Previously the problem house incorporated a heating layout with the exception that no ducts or register sizes were shown. In the 1949 program, a new house plan will be worked out in class. The problem plan for both gravity and forced air will be blank, and will be worked out completely during the class period. There will be a gravity and winter air conditioning written questionnaire to be completed in class and the students will be able to complete their test plans at home—a three-week period will be permitted.

C. B. TAYLOR

Managing Director

California

FALL activities of the Institute of Gas Heating Industries of Los Angeles are under way, with an extensive program for the promotion of better gas heating.

A new course in the Institute's school for gas heating service men began on September 13 at Pasadena, and a second class on September 14 in Hollywood. The course runs every Monday and Tuesday evening for eight weeks.

"Not only is this educational program most important to our industry," Richard O. Montrief, Institute president declared, "but it has an important bearing on the health and comfort of the general public by insuring the ultimate in safety and efficiency in gas heating installations."

ERNEST W. KIMMELL

Managing Director

Indiana

IN THE August issue of our bulletin we reprinted the editorial page of an issue of The Construction News. Written by Marshall Abrams, managing director of the Indiana Construction Industry Policy Committee, it strongly condemned the public housing provisions of the Taft-Ellender-Wagner bill and quoted a letter written to the members of our association on the same subject by our president, H. W. Meggs. Contacting our representatives in Washington to apprise them of the attitude of the Indiana construction industry toward the T-E-W bill was urged in both cases.

An excerpt from the report developed by the Sheet Metal Contractors' National Association on the critical shortage of sheets is also included in the bulletin. The SMCNA has been attempting to use this report to secure allocations under the voluntary allocation program and our association has lent full support to their efforts.

The association's biggest social event of the fall season, the annual picnic, was again a big success. All the trimmings for a fine picnic were donated by the supply houses and horse shoe pitching and the ball game were enthusiastically enjoyed by the more athletic picnickers.

FRANK E. ANDERSON

Secretary

New York City

THE Roofing and Sheet Metal Crafts Institute has resumed its regular schedule of two meetings a month at the Pennsylvania Hotel.

The August issue of the Institute Ticker comments on the amended workmen's compensation law, thereby increasing insurance rates. The changes in benefits are listed.

An editorial comments on business pitfalls to avoid.

Two Institute members were among the winners in the annual safety campaign conducted by the New York State Insurance Fund in connection with accident prevention. Richardson and Lucas was awarded first prize. The Tischler Roofing Co. took honorable mention under the classification of No Time Lost.

COMING EVENTS

Nov. 8-11—American Petroleum Institute, 28th Annual. Stevens Hotel, Chicago. 50 W. 50th St., New York 20, N. Y.

Dec. 5-8—The American Society of Refrigerating Engineers. 44th Annual. Hotel Statler, Washington, D. C. C. F. Holske, President, 40 W. 40th St., New York 18.

Dec. 9-10—National Warm Air Heating and Air Conditioning Association 35th Annual Convention. Hotel Cleveland, Cleveland, Ohio. Committees and Board of Directors meet December 7 and 8. George Boeddener, Managing Director, 145 Public Square, Cleveland 14, Ohio.

Jan. 24-28—Ninth International Heating and Ventilating Exposition of the American Society of Heating and Ventilating Engineers. International Amphitheatre, Chicago. A. V. Hutchinson, Secretary, 51 Madison Ave., New York 10, N. Y.

Jan. 25—National Heating Wholesalers Assn. Second Annual Convention. Blackstone Hotel, Chicago. R. M. Colegrove, Exec. Secy.; 239 Water St., Pittsburgh 22, Penn.

Feb. 3-4—Sheet Metal and Warm Air Heating Contractors' Association of Indiana, Inc., 31st Annual. Hotel Severin, Indianapolis. Homer Selch, 944 Hosbrook St., Indianapolis 3.

Feb. 6-8—Sheet Metal Contractors Assn. of Wisconsin, Inc., 34th Annual. Hotel Schroeder. A. H. Luedke, Exec. Secy., 225 E Michigan St., Milwaukee 2, Wis.

May 9-11—Liquefied Petroleum Gas Assn. Annual and Trade Show. Palmer House, Chicago, Ill. Howard D. White, Exec. Vice President, 11 S. LaSalle St., Chicago 3, Ill.

EQUIPMENT DEVELOPMENTS

Closet Furnaces.....213

Two new gas-fired Clipper closet units—the CCU 72U and the CCU 90U—have Btuh input of 72,000 and 90,000 respectively. The smaller occupies a space 20 x 25 x 67¼ in., while the larger occupies a space 23 x 25 x 67¼ in. Units are assembled in baked enamel finished cabinets.

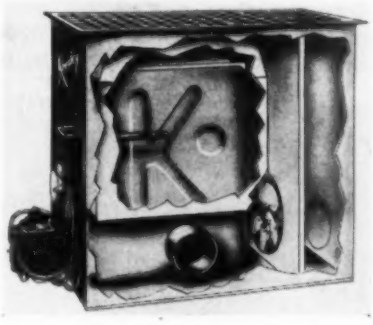
The metal wool filter may be installed at the bottom, side or back of the unit.

Henderson Furnace & Mfg. Co., Sebastopol, Calif.

Floor Furnace.....214

The Evenheat oil floor furnace (Model EVF) is long and narrow—20 x 36 in. and requiring 36 in. depth. Rated capacity is 72,800 Btuh. There is also a dual wall register type, Model EVD.

A blower supplies air for complete fuel combustion to the forced air induction burner. A circulating fan,



suspended in rubber, forces circulation of warm air. Cold air returns may be installed.

Thermostatic controls hold the temperature to defined limits. A variable speed burner control maintains the proper blower speeds for the amount of fuel consumed in reaching or maintaining the desired temperature.

The heating element is heavily constructed of 14 and 16 ga. steel, with all seams electrically welded.

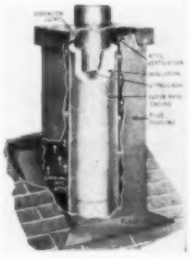
Use Coupon on this page

Grille and casing are finished in brown hammertone.

Kresky Mfg. Co., Inc., Second & H Sts., Petaluma, Calif.

Packaged Chimney.....215

A light weight prefabricated flue—the Packaged Chimney—is supported from the ceiling and roof and does not require brick work.



The central flue pipe is a porcelain enameled metal liner. Between this and an outer metal casing is a long fiber asbestos insulation.

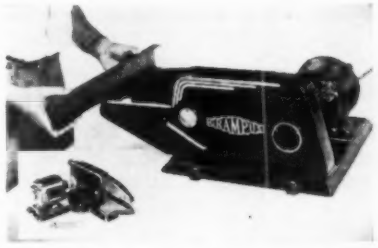
Advantages are ease of installation, durability, efficient operation and low cost. Acceptable by Underwriters Laboratories for all fuels.

Condensation Engineering Corp., 122 S. Michigan Ave., Chicago 3, Ill.

Shear 216

A high speed, low cost shear—the Grampus—has a small head and base, for inside cutting, both straight and contour, by means of a simple locking device. No starting hole is required for inside work.

There is finger tip control of the stroke, and rapid adjustment of the



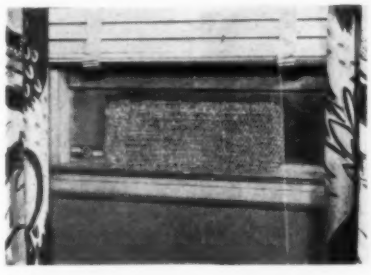
cutting blades for light material. Rated to include 14 ga. mild steel.

The unit weighs 100 lbs, including its ¼ hp motor.

Federal Machinery Co., 134 Grand St., New York 13, N. Y.

Window Filter.....217

Specially designed adhesive coated aluminum baffles are utilized in the "Wind-O-Filter," an extendible aluminum window filter to provide



year-round protection against dirt, dust and pollen.

Three basic sizes, all 8 in. wide, are extendible from 20-26, 26-32, and 32-38 in.

Research Products Corp., Madison, Wis.

MAIL THIS NOW!

We will ask the manufacturers to send full particulars about the products and literature mentioned. **10-48**

Equipment Developments

213 214 215 216 217 218 219 220 221 222
223 224 225 226 227 228 229 230 231 232
233 234

New Literature

334 335 336 337 338 339 340 341 342

Manufacturer ☐ **Jobber** ☐ **Dealer** ☐

Name .....

Company .....

Address .....

Address: AMERICAN ARTISAN, 6 North Michigan Ave., Chicago 2, Illinois

EQUIPMENT DEVELOPMENTS

Use Coupon on page 113

Vertical Conditioner.....218

An oil fired vertical winter air conditioner occupies only 3½ sq ft of floor space and is rated at 100,000 Btuh capacity.

The Space Saver is fired with the Gilbarco GCS burner equipped with the Economy clutch, a patented action which starts the burner fan in operation before the oil is ignited and permits the fan to continue for several seconds after the flame has ceased.

The counterflow principle of heat transfer is employed.

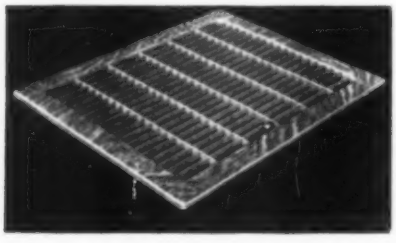
The Space Saver is a packaged unit with burner and combustion safety control mounted and wired. the stainless steel combustion chamber in place, and the blower mounted and wired.

Gilbert & Barker Mfg. Co., West Springfield, Mass.

Floor Register.....219

A new model floor register features a compressed face mesh locked in a one-piece margin. The heel proof mesh measures 7/16 x 1-15/16 in. between frets and provides maximum free area averaging over 75 per cent.

The process of compressing the bars of the mesh together under



extreme pressure results in an exceptionally rigid register face. The one piece margin on popular sizes, into which the mesh is securely locked, presents a neat appearance by eliminating the mitred corners and permits a higher quality finish.

The louvres in the register valve run the short dimension, permitting the operating handle to be located in the side of the register face mesh. The louvres operate easily and close tightly.

Hart & Cooley Mfg. Co., Holland, Mich.

Limit Control.....220

A low cost, non-electrical, emergency limit control is announced to check overheated furnaces. This safety control is designed for hand fired furnaces with manual or thermostatic control.

When bonnet temperatures reach

a pre-set limit, the ash pit damper is automatically dropped.

On electrically controlled heating systems it is an added safety device in the event of power failure.

The control is mechanically simple and easy to install.

Field Control Division, Mendota, Ill.

Tool Kit.....221

Packaged in a metal carrying kit are: a Royal Clipper metal cutter for small radius inside cuts, a heavy

duty Royal Clipper for straight line cutting on heavier metals, a metal shrinker to work inside curves in angles up to 16 ga., and a metal stretcher for outside curves.

These tools are intended for forming and edging as needed in making a canopy, forming the sides of machine guards, etc. The combination offers a saving over the individual price of the tools.

C-B Tool Co., Lancaster, Penn.

Magnetic Gas Valve.....222

The K-3H hermetically sealed magnetic gas valve combines design and operational features to eliminate the possibility of gummy or foreign matter forming in the solenoid and restricting plunger action. A diaphragm construction seals the operator from the fuel gas without interfering with the valve operation. The solenoid operator is sealed to atmosphere and in event of diaphragm rupture prevents all external gas leakage. The K-3H closes automatically upon current failure.

This valve is suitable for natural, manufactured, mixed, and all LP Gases.

General Controls Co., 801 Allen Ave., Glendale 1, Calif.

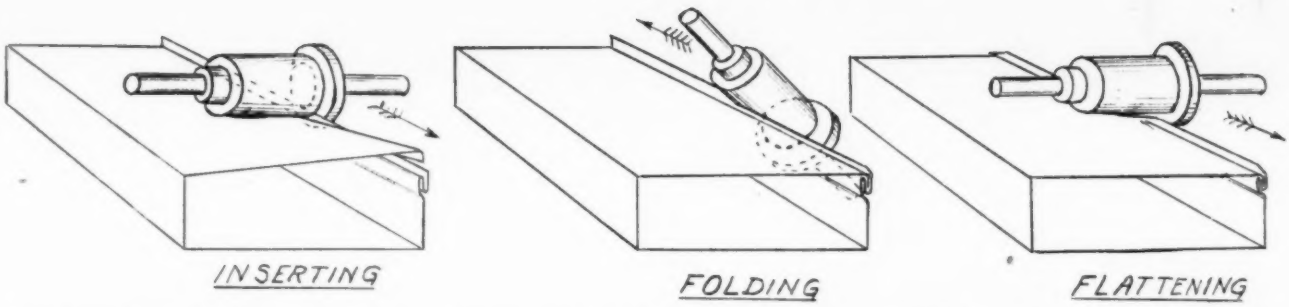
CO_2 Indicator.....223

A new carbon dioxide indicator for testing efficiency of oil burners, furnaces, and other heating equip-

ment features simplified construction and quick readings.

Model 60 is constructed of transparent material with metal parts of stainless steel. The indicator is 8 in. long and 2 in. in diameter.

F. W. Dwyer Mfg. Co., 317 S. Western Ave., Chicago 12, Ill.



Pittsburgh Lock Hammer . . 224

The Noiseless hammer for Pittsburgh lock seaming in light gauge metal is a portable, inexpensive tool. With the tool, three passes insert, fold, and flatten the seam, requiring 20 seconds for an 8 ft duct as against one minute 40 seconds with a regular hammer.

Fox Noiseless Hammer Co., 619 MacDade Blvd., Collingdale, Penn.

Oil Burning Conditioner . . . 225

An automatic oil burning winter air conditioner occupies less than a square yard of floor space and delivers 72,000 Btuh at the bonnet and 61,200 at the register.

A vaporizing type burner with a stainless steel combustion chamber is used. Automatic humidification, forced air circulation and filtering are provided. Thermostatic control is standard.

Cabinet is standard two-tone blue baked enamel.

Armstrong Furnace Co., 851 W. Third St., Columbus 8, Ohio.

Heating Cable 226

Heating cable sets are available for mounting along the roof, bordering the eaves in a zig-zag design, closely resembling teeth of a saw, to keep an open channel through ice dams which form on roof eaves causing seepage.

A 15 foot strip of roof, about three feet wide, can be protected by 60 feet of cable. In metal gutters, wooden strips or blocks should be set as insulators and to prevent excessive loss of the heat carried by the cable.

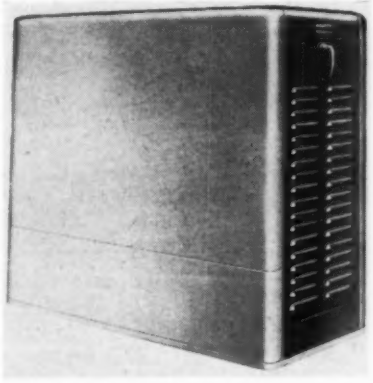
G-E heating cable is available in a convenient set with sixty feet of flexible, lead covered, insulated resistance wire with both ends connected to an ordinary attachment plug. A weather-proof convenience

outlet can be installed on the outside of a house to furnish 110 volts, required for the cable.

General Electric Co., 1 River Rd., Schenectady 5, N. Y.

Oil-Fired Conditioner 227

Two Series 80 oil fired Ko-Z-Aire conditioning units are in production in both conventional and Hi-Boy



design. The conventional model has an output of 85,400 Btuh and the Hi-Boy an output of 82,000 Btuh. Both are Underwriters' Laboratory approved.

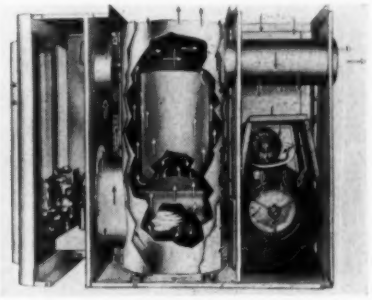
Both oil fired models are delivered completely assembled with M-H controls, wired and ready for installation. Either model is available equipped with the new Ko-Z-Aire model CA gun-type burner.

Ko-Z-Aire, Inc., Red Oak, Iowa.

New Models 228

Three oil burning furnace-burner units, Models 70, 10A, and 15A, rated 70,000, 100,000 and 150,000 Btuh at the bonnet, have been styled by George Walker.

A stainless steel "Glo-Quick"



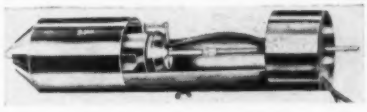
combustion chamber is employed in the small unit, Model 70.

The new units have heavy gauge, all welded angle panel construction with a full steel base to assure maximum sturdiness for the jacket. Finish is chrome trimmed, baked enamel hammerloid.

Williams Oil-O-Matic Div., Eureka Williams Corp., Bloomington, Ill.

Heat Blast Tube 229

Flame control Turbulator head units are assembled in a specially designed chrome plated blast tube with a top opening for adjustments. There are three lengths—12, 14 and



22 in. with diameters to fit the housings of most gun type burners.

The unit comes with a length of oil line and extra long electrode cables with cage clips.

Richfield Mfg. Corp., 139 S. Grand Ave., Baldwin, L. I., N. Y.

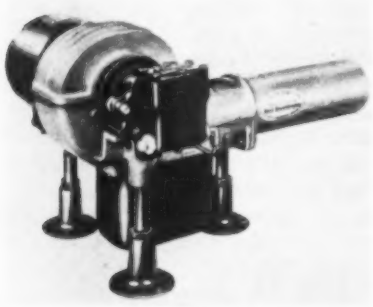
EQUIPMENT DEVELOPMENTS

Use Coupon on page 113

Oil Burner 230

Model 600 Air-Seel oil burner has been designed to burn catalytic cracked oil when fired at the prescribed gallonage of .75 to 1.35 fph. for the smaller home.

Features include the Air-Seel fan that conserves the heat it makes,



the one piece time saver top, chrome steel ignition rods, progressive rotation and certified installation. Air-Seel 600 is manufactured in accordance with Commercial Standard CS75-39.

Silent Glow Oil Burner Corp., 1477 Park St., Hartford 6, Conn.

Fastener 231

A spring steel Snap Nut anchors nut to panel for blind attachments. The nut is pressed into assembly position.

This fastener will accommodate Nos. 8 and 10 sheet metal screws.

and it will withstand a tightening torque of 35 to 45 inch pounds.

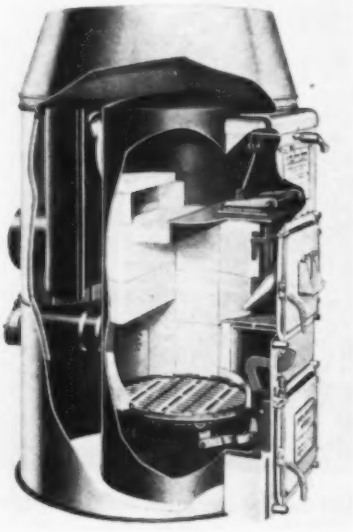
Features are fastening elasticity, easy removal, and protection against dead-tight fastening which causes chipping and crazing of enamel.

Prestole Corporation, 3101 Bellevue Rd., Toledo 6, Ohio.

Smokeless Furnace 232

A manually fired, steel furnace using high volatility bituminous coals is offered in capacities of 55,000, 70,000 and 100,000 Btuh at bonnet for gravity or forced air operation in round or square casings. Models LS2 and LSC2.

All volatiles from burning coal are pulled downward over a live coke



bed where sufficient air is supplied for ignition. Practically all heat value is utilized and smoke consumed. Only fly ash remains.

Air for combustion is accurately and automatically controlled by room thermostat, motor driven dampers, and barometric draft control. Added safety is provided by high limit bonnet control switch.

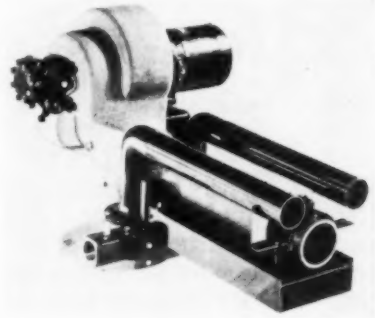
Lennox Furnace Co., Marshalltown, Iowa.

Dual Fuel Burner 233

An electronic controlled dual fuel combination gas and oil burner is available in three models—70,000 to 700,000 Btuh, oil or gas. This unit employs a high pressure atomizing gun type burner and an atmospheric inshot gas burner unified in one packaged unit, with one central control system.

The electronic control system utilizes both a flame and a ground rod to rectify and establish flame circuit.

Employing no pilot light (except in case of power failure where a standby pilot is provided) the ignition of the gas cycle is accomplished by utilizing a dying oil flame, thereby proving the condition of the oil burner cycle on each individual start. Controls will fail safe in one-



half second in case of flame failure. The change from oil to gas or gas to oil is instantaneous.

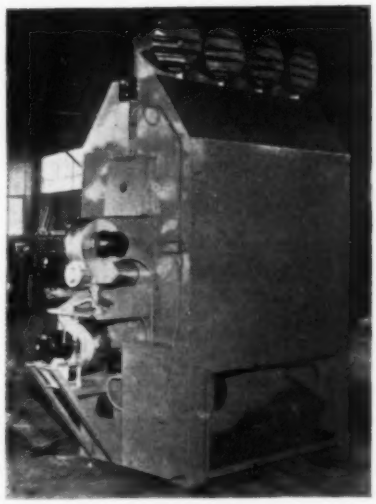
A sealed outside thermostat is set at a predetermined temperature above the gas company's peak load, which automatically changes fuel used as outside temperature demands.

John C. Junior Co., 444 E. 63rd St., Kansas City, Mo.

Industrial Furnace 234

An industrial warm air unit heater has been designed primarily for heating and ventilating of industrial and commercial buildings, but can be used for process work and make-up air applications.

Fuel may be oil, gas or coal. Capacities range from 300,000 to 2,-



000,000 Btuh for the gas or oil fired package unit. Stoker fired capacities range from 500,000 to 2,000,000 Btuh.

Special features include 4 pass gas travel, separate induced draft fan and placing of bearings on outside of heater for easy maintenance.

Arthur A. Olson & Co., Canfield, Ohio.

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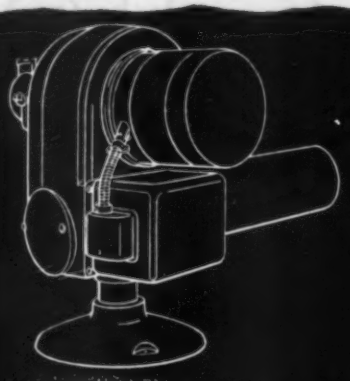

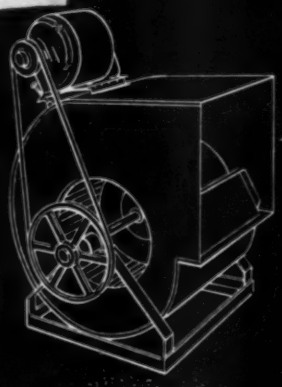

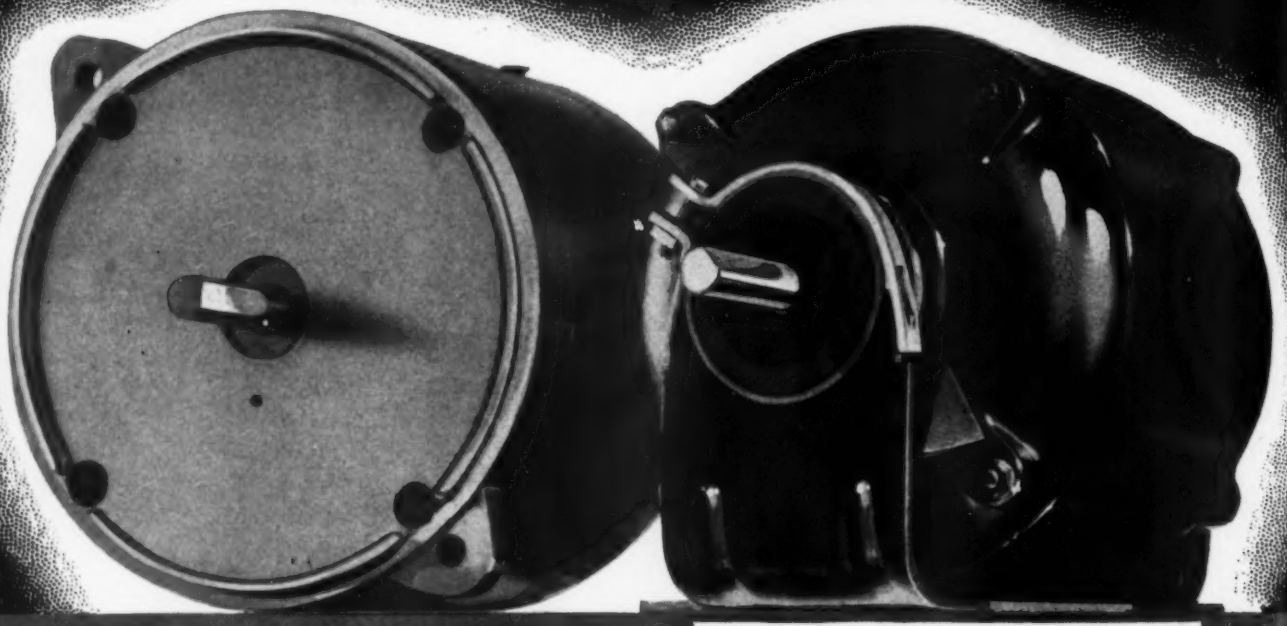

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Better electric motors

Electric Motors

Ball Bearings

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Jack & Heintz announces a new and *proved* blower motor (right) to team up with the popular J & H oil burner motor (left) for the quiet, dependable powering of heating equipment. Both of these motors, developed in cooperation with manufacturers and contractors of the heating and air conditioning field, are meeting enthusiastic acceptance everywhere. Each is the result of J & H superb engineering skill and precision-production "know-how." Write for full information on the J & H Motor Franchise for your area.

Aircraft Starters

Aircraft Generators

Aircraft Inverters

JACK & HEINTZ JH PRECISION INDUSTRIES, INC., *Cleveland 1, Ohio*

Greater Diffusion

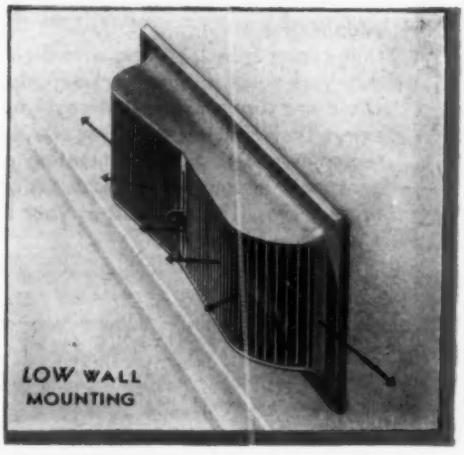
for either

HIGH OR LOW WALL MOUNTING

with the HONEYWELL REGISTER

Mount it anywhere—high wall, low wall—and the handsome Honeywell Air Diffusion Register will show you an amazing new standard of performance for all forced air installations.

You get *true* air diffusion with the Honeywell Register. It is factory-set for an air diffusion pattern of 120°! That's virtually three times greater than ordinary registers. Instead of disturbing air blasts with drafts and cold spots, the unique design of this new register diffuses a gentle, even blanket of air to every corner of the room—and without unsightly wall and ceiling streaks.



What's more, whenever you use the Honeywell Register, your installation costs are drastically cut. Branch quadrants are eliminated for all velocities under 800 fpm. Labor and materials thus saved *more* than cover initial extra cost. Only *one* man—not two—needed to quickly balance the entire system. Order Honeywell Registers from your wholesaler today—then *compare* results. Minneapolis-Honeywell, Minneapolis 8, Minn. In Canada: Leaside, Toronto 17, Ontario.

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FOR INSTALLATIONS THAT RECOMMEND YOU

USE THE H&C No. 130 BASEBOARD REGISTER OR

At first glance, the H&C No. 130 Baseboard Register and its companion Sidewall Register No. 330 may look like their contemporaries of the gravity and conversion type. But take a good look and compare. You'll realize then why the vast majority of farsighted installers, anxious that their jobs shall recommend them to future prospects, use these H&C registers.

In addition to such features as make for quick, easy, leak-proof installation, these registers, like all H&C products, assure top-notch efficiency and have a superior "QUALITY" appearance that comes from exacting attention to every detail of construction, workmanship and finish. These are superiorities that cost you nothing extra; that gain plenty of goodwill and recommend you to discriminating customer-prospects as long as the installation remains. Inspect Nos. 130 and 330 at your H&C Jobbers' and judge for yourself.

Write for our current catalog, No. 48 if you do not have one.

HART & COOLEY MANUFACTURING CO.
HOLLAND, MICHIGAN
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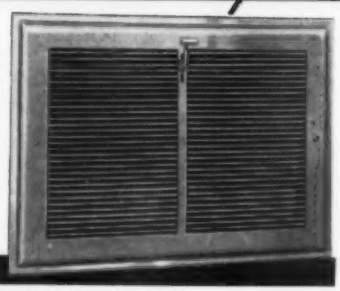
THE H&C No. 330 SIDEWALL REGISTER

H&C



In Canada: Hart & Cooley Mfg. Co., Fort Erie, N. Ontario

NEW LITERATURE

Use Coupon on Page 113

Ventilators—Revolving and Stationary 334

Catalog pages are available covering the Air-Out stationary ventilators, with specifications and price list, and the revolving ventilator.

Accurate Sheet Metal & Mfg. Works, 2336 Milwaukee Ave., Chicago 47, Ill.

Cellular Glass Insulation 335

A four page brochure on the use of Foamglas cellular glass insulation for low temperature work, including cold storage applications is offered. Foamglas is impervious to moisture, odorless, and vermin proof.

Blocks of the material are light weight and easy to cut and apply.

Pittsburgh Corning Corp., 632 Duquesne Way, Pittsburg 22, Penn.

Expanded Steel Service Facilities 336

A 12-page illustrated booklet is entitled *Expands Cleveland Steel-Service Plant.*

Beginning with a short background of the company's operations in the Cleveland area, the booklet continues with a picture story of their enlarged plant with its new cutting, handling and shipping facilities, and added space for warehousing larger stocks of steel.

Joseph T. Ryerson & Son, Inc., Box 6208, Cleveland 1, Ohio.

Fuel Oil Supply 337

"Newspaper Reports Show Ample Supply of Fuel Oil!" is the title of a 4 page folder issued to counteract last winter's publicity about the oil shortage.

The folder includes statements by the Oil Industry Information Committee, telling how the industry is breaking all records supplying the biggest demand in history.

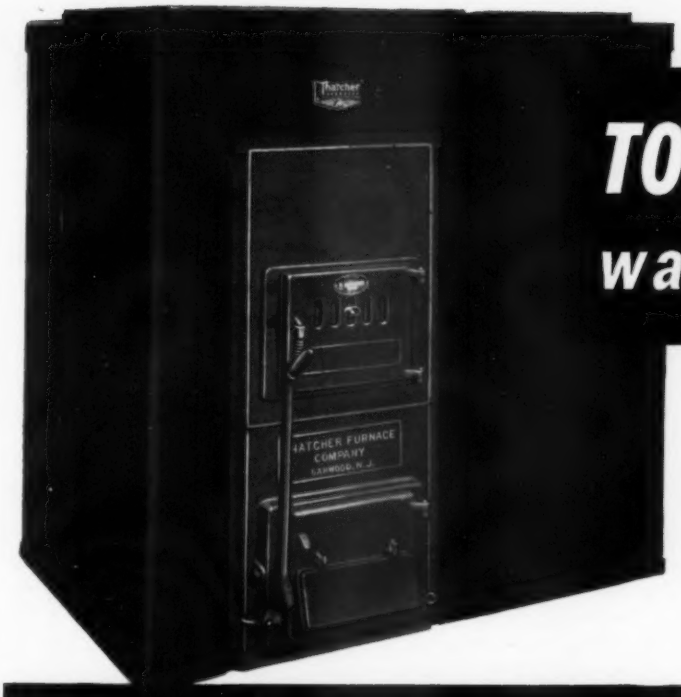
York-Heat Div. York-Shipley, Inc., Jessop Place and P. R. R., York, Penn.

Conditioner with Water Heater 338

A 4-page folder pictures and describes the Metropac air conditioner of 70,000, 120,000 and 180,000 Btuh with copper water storage tanks of 22, 30 and 40 gallons capacity respectively included within the casing.

The Metropac is an oil-fired conditioner, and the most important feature is hot water all year around. Locomotive type fire tube construction is provided for heating water. The flame from the heating unit never touches the water tank, thereby eliminating tank corrosion and heavy alkaline formations.

Metromatic Manufacturing Co., Everett, Mass.



TODAY your prospects want fuel flexibility

NEW Thatcher 481

This all-purpose Winter Air Conditioner designed For COAL — Converts QUICKLY and EASILY to OIL, GAS or STOKER, and operates with high efficiency.

Heating comfort through any fuel emergency! That's what you sell homeowners with Thatcher's NEW Series 481.

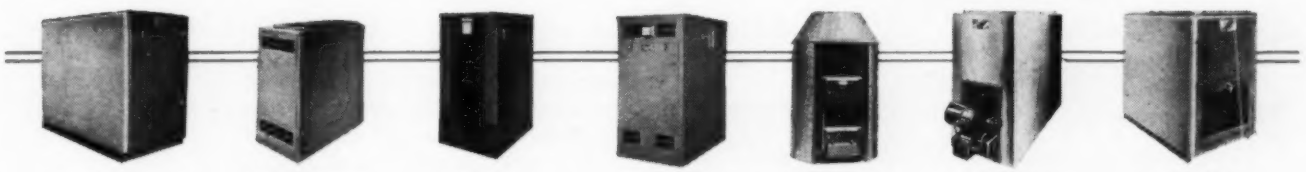
Here's the fuel flexibility homeowners want right now. And in the 481, it's backed by Thatcher's 98 years of heating know-how. This unbeatable combination means more sales, more easily. For complete details on the Series 481, write to us today.

Look at these 7 big selling features

- **FULL-SIZE REVERSIBLE BLOWER CABINET** — complete flexibility, install it on either side of the unit.
- **LARGE CAPACITY RUBBER MOUNTED BLOWER** — generous air circulation, more efficient heat transfer, quiet.
- **REPLACEABLE FILTERS** — throwaway type, easy to get at, generous filtering area.
- **HIGH RATIO OF HEATING SURFACE TO GRATE AREA** — delivers extremely high percentage of heat from fuel.
- **MASSIVE FRONT CASTINGS—LARGE DOORS—CAST IRON GRATES** — for long life, easy fire tending.
- **HEAVY GAUGE STEEL HEAT EXCHANGER** — permanently welded into a gas tight compartment.
- **HANDSOME CASTILIAN-RED JACKET** — lined with air-metering inner casing.

Thatcher
FURNACE COMPANY
Specialists in heating Since 1850

GARWOOD, NEW JERSEY



Comfortmaster Oil-Fired Air Conditioner | Comfortmaster Gas-Fired Air Conditioner | Triple-Fire All-Purpose Boiler | Oil Master Automatic Oil-Fired Boiler | Thermaster Gravity Furnace | New 550 Oil-Fired Air Conditioner | New A-204 Oil-Fired Air Conditioner

There is only ONE

Draft-O-Stat

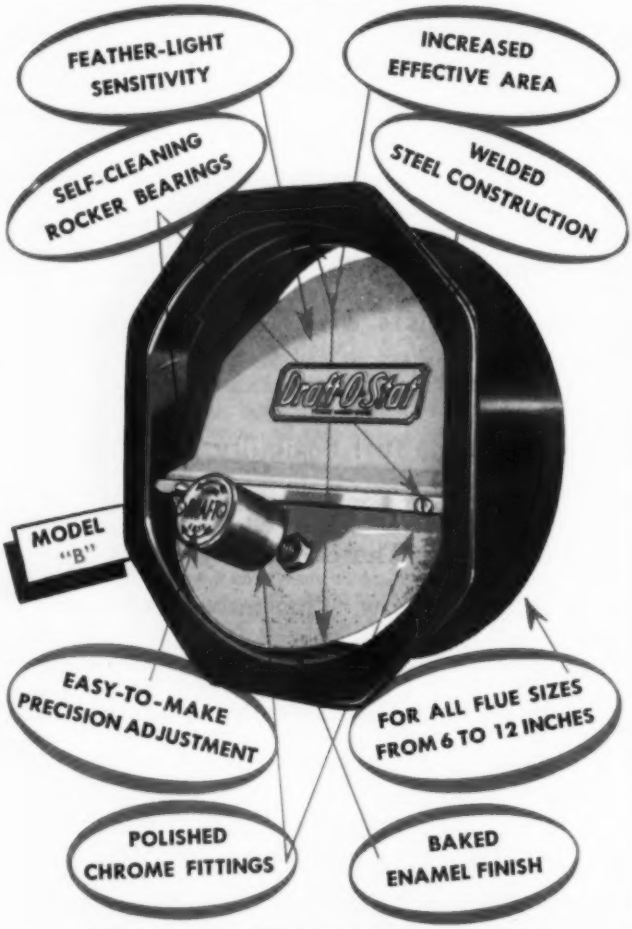
Trade Mark Registered

BAROMETRIC DRAFT CONTROL

— and HOTSTREAM makes it!

Draft-O-Stat has for many years been the standard barometric draft control mechanism for boilers, furnaces, oil burners and stokers. Hundreds of thousands of successful installations on domestic, commercial and industrial heating equipment have established its leadership in the field.

The Model "B" Draft-O-Stat with all-steel construction has been designed for greatest efficiency. It insures a steady, unchanging rate of draft in the chimney, providing maximum utilization of furnace heat. Top performance and long life is insured by the features shown below.



Model "A" Draft-O-Stat (original design) available in domestic sizes 14" to 20"; commercial sizes 16", 18", 20" and 24"; industrial sizes 24", 30" and 36".

INSIST ON **Draft-O-Stat**
FOR BEST RESULTS ON EVERY HEATING INSTALLATION

The HOTSTREAM Heater Co.

2363 EAST 69th STREET • CLEVELAND, OHIO

Manufacturers of water heaters and draft controls

NEW LITERATURE

Use Coupon on page 113

Furnace Literature 339

Four envelope stuffers are available, with space for dealer imprint, entitled "Eight Questions to Ask About the Oil Situation," "Beat Higher Fuel Cost," "Shirt Sleeve Comfort," and "What They Say About the Comfortmaster for Gas."

Thatcher Furnace Co., Garwood, N. J.

Limit-Load Conoidal Fans 340

Bulletin 3675 contains 68 pages 8½ x 11 in. illustrating and describing the Limit-Load Conoidal fans. These fans have a medium speed, double curved blade rotor with stationary directional inlet vanes.

The various wheels, outlet dampers, bearings, bases, types and arrangements are given, followed by specifications of the various sizes, and the ASHVE friction chart.

Buffalo Forge Co., 497 Broadway, Buffalo, N. Y.

Apple Storage Problems 341

"Air Purification in the Apple Storage" by R. M. Smock and F. W. Southwick, is a 52 page booklet covering methods, tests, and discussions. Subjects include scald reduction, effect on storage life, odor removal, practical applications, requirements of air purification, and construction of the air purifing unit, with summary and references.

Cornell University Agricultural Experiment Station Bulletin 843 (June 1948), Ithaca, N. Y.

Sheet Copper Application 342

"Modern Application of Sheet Copper in Building Construction" has been revised and rewritten, with new and useful material incorporated.

The book reviews new technical data derived from research and demonstrates practical application. Into its preparation has gone the experience and knowledge of sheet metal craftsmen, builders, architects, engineers and physicists.

Data has been presented precisely, the plates of details are faced by adequate descriptive text, and there is a wealth of informative and design material. While essentially technical, the book is easily understood by the apprentice and appreciated by the professional layout man.

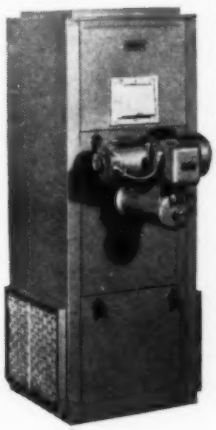
The 1948 edition contains 144 pages, 36 plates and numerous illustrations, charts and tables. It is based on the results of recent laboratory and field research into the behavior of sheet copper under thermal stresses. This scientific approach to the problem of why some installations do not stand up has developed modern techniques of installing sheet copper, radically different from traditional methods.

Copper & Brass Research Association, 420 Lexington Ave., New York 17, N. Y.

There's a FLUID HEAT Model to SELL Every Prospect!

For Large Homes, this unit gives a full 200,000 BTU/hr. (bonnet rating) to meet heaviest heating requirements.

For Average Homes, three Fluid Heat units are available, giving bonnet ratings of 85,000, 120,000 and 150,000 BTU/hr. All with new, eye-appealing jackets.



For Smallest Homes With or Without Basements, this 65,000 BTU Utility Unit is less than five feet high, smaller than a home refrigerator, yet does a dependable heating job. Ripe for volume sales to [illegible] home con[illegible]ors.

FLUID HEAT helps you make *more* sales—by making *more* models— to satisfy the personal preferences of *more* customers! Take our Warm Air Furnaces, for example. Here are five different units, ranging in capacity from 65,000 BTU/hr. to 200,000 BTU/hr. They give you a crack at every type of installation, from smallest homes without basements to large homes and commercial establishments.

And that's not all! Priced to fit every pocketbook, Fluid Heat units are loaded with fast-selling features like the "Fuel Saver" Control, C.A.C. (Continuous Air Circulation), eye-appealing jackets . . . products of a wide-awake development laboratory that gives you the jump on competition. Fluid Heat units' husky, well-designed construction keeps customers happy and reduces your service problems to a minimum.

In addition, the big, complete Fluid Heat line offers three Boiler-Burner Units for steam or hot water heating systems and, for conversion or replacement, four Pressure Burners and two Rotary Wall Flame Burners. Write today for full details on a friendly, profitable Fluid Heat Dealer Franchise, *most valuable in the industry!* Address: FLUID HEAT OIL BURNER DIVISION, Anchor Post Products, Inc., 6720 Eastern Ave., Baltimore 24, Maryland.

fluid heat
OIL BURNER

"WORLD'S ECONOMY CHAMPION"
Manufactured by Anchor Post Products, Inc.
Baltimore 24, Md. Established 1892

ATTENTION!
Oil Burner Dealers in:

- TERRE HAUTE, INDIANA
- MIDLAND, MICHIGAN
- CATSKILL, NEW YORK
- WINCHESTER, VIRGINIA

There are a few valuable Fluid Heat Dealer Franchises open in your area! Take advantage of Fluid Heat's new models, new openings for sizable profits. Write today for details.

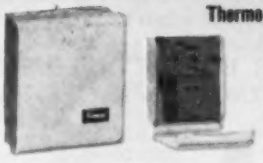
Smooth Operation

Depend on Sampsel automatic Controls for accurate and flawless operation. They assure finest possible performance from the heating equipment you build or sell. Sampsel engineering consistently brings you basic developments in heating controls *first*; Sampsel precision manufacture guarantees dependable quality.

Sequence Draft Control

Lets you offer your customers savings of up to 30% on fuel oil! Easily and economically installed on any oil-fired domestic furnace or boiler.

Sampsel Engineering puts you out in front



Thermo-Interruption Stoker Fire Pilot

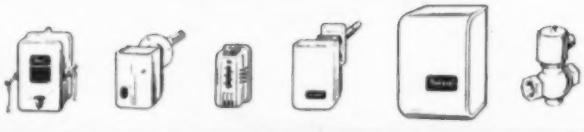
Performs normal fire pilot functions *and more!* Permits burning coals formerly unsuitable for stoker firing; saves fuel; reduces service and adjustment calls.

Write for catalog describing the complete line of Sampsel automatic Controls for gas, coal or oil-fired heating equipment.

Sampsel Time Control, Inc.

Spring Valley, Ill.

Sampsel
AUTOMATIC CONTROLS



for MORE profits, LESS servicing, SELL Sampsel

INDUSTRY ITEMS

WILLIAMS OIL-O-MATIC division of the Eureka Williams Corp., Bloomington, Illinois has completed a series of sales meetings that traveled over nine states and used a fresh approach to the subject of whetting dealer interest.

The meetings began in Charlotte, N. C., ended in Minneapolis, Minn., and featured the trial of Alibi Ike, the war-born telephone order-taker, who has been prominent in some sectors of the oil business. An overwhelming mass of evidence was brought to bear against Alibi Ike and the climax of the program (see photo) was when W. A. Matheson, head of Oil-O-Matic, appeared to drive home all the points that helped to convict poor, old Alibi.

Mr. Matheson stated the need for dramatic and powerful selling to overcome the adverse propaganda which had changed the Passionate Purchaser of oil heat into the Bashful Buyer.

CARROLL M. BAUMGARDNER was recently elected to the position of vice president for sales for the National Radiator Co. of Johnstown, Pennslyvania. Mr. Baumgardner had previously been associated with the United States Radiator Corp. of Detroit, Michigan.

PEERLESS FOUNDRY CO. of Indianapolis, Indiana has recently completed an extensive building program that is aimed at expanding production and employment. All parts of the plant that were damaged in the fire that took place in 1945 have been restored and re-equipped. Also, a new foundry addition has been erected and equipped at a cost of $150,000. This foundry will turn out castings for Peerless and Round Oak of Dowagiac, Michigan, a subsidiary acquired by Peerless last year.

Completion of the expansion program is expected to make it possible to employ 250 persons and add considerably to Peerless' capactiy for warm air furnaces. Total floor space for production in the plants has been increased by 22,000 sq. ft.

Here's everything you need...

READY-TO-USE

BERGER

Roof Drainage Products

of Republic "Enduro" Stainless Steel

- **Longer Lasting**
- **Better Looking**
- **Stronger**
- **Simple to Install**

. . . to sell and install *complete* stainless steel roof drainage systems. All ready-to-use materials, accessories, fittings are available from the one dependable source . . . all are made of Republic ENDURO Stainless Steel—the metal which has proved its value by more than twenty years' service in construction of all types.

You confidently can tell your customers that Berger ENDURO Roof Drainage Systems will last for the life of the building . . . are stronger, more attractive than ordinary systems . . . do not rust or tarnish . . . do not bleed or discolor paint . . . require little or no maintenance . . . cost less in the long run.

Berger ENDURO Stainless Steel Eaves Trough, "K" Gutter, Conductor Pipe, fittings and accessories are simple to install, easy to form, cut and solder. Although painting is unnecessary, it may be done if desired. Get in touch with your jobber today. See for yourself his complete stocks of Berger Roof Drainage Products made of Republic ENDURO Stainless Steel—or, write us for complete information.

BERGER MANUFACTURING DIVISION
REPUBLIC STEEL CORPORATION
CANTON 5, OHIO

Berger Stainless Steel Drainage Products include Snaptite Eaves Trough; "K" Gutter; Plain Round, Corrugated Round and Corrugated Square Conductor Pipe; plus a complete line of all necessary fittings. All are made of 28 gauge ENDURO Stainless Steel, type 301, No. 2 satin finish. Accessories illustrated are: "D" end and drop, Mitres, Elbow, "C" End, "D" Drop and Gutter Spike with ferrule.

Now!

Luminous Flame Model

JOHN ZINK
CONVERSION BURNERS
Available for
IMMEDIATE DELIVERY

LUMINOUS FLAME MODEL

Easy to install. Operates manually or automatically. Burns clean fuel—natural, mixed, manufactured or LP gases—without soot or smoke. Luminous flame radiates heat two to three times faster than a blue flame. Four sizes available for either vertical or horizontal firing.

BLUE FLAME MODEL

Designed to meet the requirements of this type of burner. Capacity range of 100,000 to 200,000 Btu/hr. for operation on natural, mixed or manufactured gases. Manual or automatic operation. Easy to install.

Both types easily cleaned or adjusted

Write for Literature

John Zink Company

4401 South Peoria

TULSA, OKLAHOMA

New York - Salt Lake City - Houston - Los Angeles

INDUSTRY ITEMS

AIRTEX CORP., Chicago distributors of Janitrol gas heating equipment, held a meeting for their dealers late in September to introduce the new line of gas fired, winter air conditioners developed by the manufacturer.

Jack Trimble uses a cutaway view of the new model Janitrol to point out its features.

The program consisted of a display of the new unit and a description of the features incorporated in it. Jack Trimble, chief engineer of Janitrol, was on hand to explain how and why the new model was engineered as it was. He also offered some comments on comfort heating, putting particular emphasis on continuous air circulation. Harry Gurney, regional sales manager, followed Mr. Trimble and discussed the sales features of the new models. He also told of the comprehensive dealer-support advertising campaign that has been mapped out by Surface Combustion.

CRISE MFG. CO., has completed some extensive alterations in its plant at Columbus, Ohio. Additional machine tools have been purchased and straight line assembly methods installed.

These changes were dictated by demand for Crise products and the company now has 45,000 sq ft of floor space devoted to the manufacture of temperature controls.

R. L. PERSONS has been named district manager of the St. Louis, Missouri territory for Penn Electric Switch Co. He replaces O. G. Tinkey, former manager.

Before joining Penn, Persons was assistant sales manager of a division of McQuay-Norris Mfg. Co. of St. Louis. Previously he held a similar position with the L. M. Persons Corp. of the same city. Persons has had considerable field engineering experience in the application of controls for heating, refrigeration, air conditioning, pumps, air compressors and safety controls for engines.

Make Peerless Electric Your Headquarters for PACKAGE UNITS AND BLOWERS

- **PEERLESS EQUIPMENT IS COMPLETE**
  Manufactured entirely in our own modern plant—not an assembled line.
- **PEERLESS EQUIPMENT IS PRICED RIGHT**
  bigger profits for you.
- **PEERLESS EQUIPMENT IS DEPENDABLE**
  reducing service worries on your part.

PEERLESS AIRBOY DIRECT DRIVE BLOWER

Here's a direct drive blower that delivers 850 cubic feet of air per minute—sufficient for a house of approximately 10,000 cubic feet. 3-speed motor with motor blower unit rubber cushioned. Blower wheel dynamically and statically balanced, a very compact unit of attractive appearance, shipped assembled, ready to work.

PEERLESS BELT DRIVE PACKAGE UNITS

New modern cabinet of rounded corner construction. Each unit complete. Includes cabinet, Peerless blower, Peerless motor, filters, belt, pulleys, automatic belt tension device, bonnet control and felt pads. A variable pitch motor pulley provides speedy adjustment for winter and summer use. Sizes from 9″ to 21″, 9″ to 15″ sizes shipped completely assembled.

BLOWER ASSEMBLIES—BELT AND DIRECT DRIVE

Belt drive assemblies with either top or rear mounted motor arrangement for those who incorporate this blower in their own furnaces or make up their own cabinets. Motors on both types are mounted with resilient bases to prevent vibration. Direct drive assemblies use specially designed Peerless capacitator motors that are exceptionally efficient and quiet in operation. Blower wheels, direct connected to motor, are forward curved, dynamically and statically balanced.

PEERLESS AIRBOY BLOWER ASSEMBLY

This is the same motor and blower unit, without cabinet, that is used in the Airboy Package unit. Note the compactness of the complete assembly. The two motor bearings are the only bearings in the unit.

THE Peerless Electric COMPANY

ESTABLISHED 1893 • WARREN, OHIO

• MANUFACTURERS OF MOTORS FANS AND BLOWERS

FOR

Quality Products
Prompt Service
Profitable Cooperation

Buy from a Herman Nelson Distributor like Hoe Supply Company of Christopher, Illinois.

E. D. Trogola, Vice-President, Hoe Supply Co., Christopher, Illinois

The Herman Nelson Corporation and its carefully selected Distributors, like Hoe Supply Co., are rightfully proud of the reputation they have established in the heating and ventilating industry. This reputation is based on a Herman Nelson policy established 42 years ago . . . that nothing less than top-quality products, reliable service and intelligent cooperation can be acceptable.

The Products? Thousands of satisfied owners all over America have learned through actual experience that you can't buy better heating and ventilating equipment than that bearing the Herman Nelson nameplate.

Service? Prompt delivery of Herman Nelson products is assured through aggressive Distributors who stock both the equipment and materials required for installation.

Cooperation? Timely sales promotion and comprehensive engineering data, furnished by Herman Nelson, provide that extra spark that leads to more profits for you as a dealer.

Quality products, prompt service and intelligent cooperation — these are the keys to increased business. You'll find them all at your nearest Herman Nelson Distributor.

THE HERMAN NELSON CORPORATION
Since 1906 Manufacturers of Quality Heating and Ventilating Products
MOLINE, ILLINOIS

INDUSTRY ITEMS

INLAND STEEL PRODUCTS Co., with main plant and offices at Milwaukee, Wisconsin, has announced the opening of a new branch office and warehouse at St. Louis, Missouri. John E. Meroney, the company's sales representative in this area for several years, has been appointed district sales manager in charge of the St. Louis division.

Inland Steel Products Co., formerly Milcor Steel Co., is a nationally known manufacturer of metal building products. The new branch will be used for distribution of the company's products in St. Louis and the surrounding area.

The branch property, acquired from St. Louis University, includes a modern, two story fireproof building with approximately 86,000 sq ft of floor space plus parking, loading and distribution facilities.

John E. Meroney

John A. Palys

JOHN A. PALYS is now assistant advertising and promotion manager for Jones & Brown, Inc., of Pittsburgh, Pennsylvania. Mr. Palys had considerable experience in sales, advertising and sales promotion when he was with the Heating & Refrigeration division of Bacharach Industrial Instrument Co. He also spent some time with Sullivan and Rayhawk, an independent market research organization.

IN A MOVE TO ACCENTUATE the sales efforts of the American Radiator & Standard Sanitary Corp., ten promotions were recently announced.

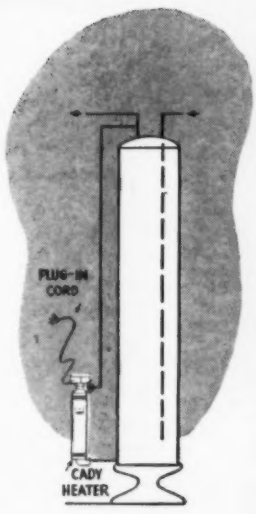
Daniel J. Quinn, a general sales field manager, has been appointed assistant general manager of sales. He has been associated with American-Standard and its predecessor companies since 1925. He has made his headquarters in Pittsburgh for the past two years.

Harry F. Beglen, field manager with headquarters in Chicago, was promoted to district sales manager of the central division. He will remain in Chicago and will supervise the sales activities of offices located in Chicago, Detroit, Kansas City, St. Louis, Minnesota, and Texas.

Edward J. Duke, who has been manager of the Los Angeles sales office since 1935, was promoted to district sales manager of the western division, with headquarters in San Francisco. He will supervise the sales activi-

HERE'S AN *Easy Set-up* FOR ADDED SALES in the warm air furnace market!

AN ELECTRIC WATER HEATER *that you can install*



- **NO NEW WIRING NEEDED**
- **ONLY 2 PIPE CONNECTIONS**
- **DESIGNED FOR ANY 5 TO 30 GALLON TANK.**

THE NEW CADY ELECTRIC WATER HEATER offers you a worthwhile opportunity to get an added share of business in the warm air furnace market. It's fast-selling because it's low-cost, clean, odorless, trouble-free, dependable and economical. A money-maker, because it's so easy to install. All you do is connect two ½" pipes to the range boiler, and plug it into any 110-120 volt A.C. wall outlet.

The Cady Water Heater is a quality product throughout. Heating element approved by Underwriters' Laboratories. Copper and brass waterways throughout. Fiberglas insulated metal jacket. Positive, built-in automatic control with temperature adjustable 80° to 180°. 1000-watt element recovery rate 7½ gallons per hour, 60° rise. 1500-watt element, 10½ gallons per hour. 6-foot plug-in cord. Size 4½" x 16½" overall. Write for full particulars. THE CADY COMPANY, Dept. S, 123 Georgia Avenue, Providence 5, R. I. (Subsidiary of General Fittings Co.)

AUTOMATIC CADY ELECTRIC
WATER HEATER

INDEPENDENT
Baseboard Registers
with Bendable Fins

No. 92 Two-piece, with removable grille

★ The simple artistic lines of this register express streamline design at its best and harmonize with the furnishings of the modern home. Fins are regularly set to deflect air flow slightly upward; but being easily bendable, they can be adjusted to direct air flow straight outward or downward, as required. Scientific design affords large open area with minimum air resistance.

Send for Catalog 48

Always Leading—Always Progressing

THE INDEPENDENT REGISTER CO.
3747 E. 93rd STREET · CLEVELAND, OHIO

INDUSTRY ITEMS

ties of offices located in Los Angeles, San Francisco, Denver, and Seattle.

H. M. Anderson, manager of the Seattle sales office, will be moved to Los Angeles to succeed Mr. Duke as manager of that office. Mr. Anderson's successor in Seattle is Vincent H. Hoefling, of the Richmond, Va. sales office.

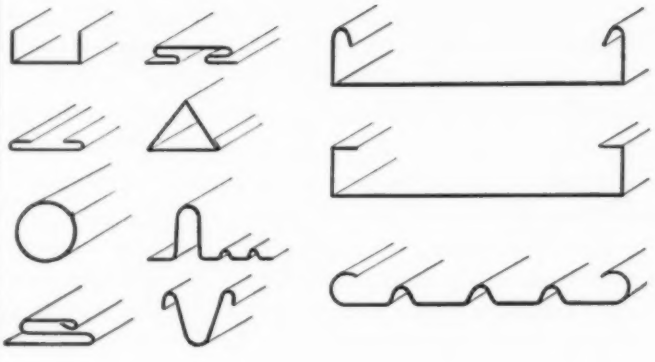
L. A. Kelly, manager of the New York sales office, has been promoted to district sales manager of the northeastern division. He will retain his headquarters in New York, and will supervise the sales activities of offices located in New York, Boston, Buffalo, and Newark. He succeeds Mr. Quinn.

Daniel J. Keefe, manager of the Buffalo sales office has been promoted to manager of the New York sales office, succeeding Mr. Kelly. Mr. Keefe, in turn, is succeeded as manager of the Buffalo sales office by C. W. Hewlett, of Syracuse.

Harry H. Steck, field manager, assumes the duties of district sales manager of the southeastern division, with headquarters in Washington, D. C. He will supervise the sales activities of offices located in Washington, Atlanta, Baltimore, Cincinnati, Philadelphia, Pittsburgh, and Richmond, Va.

Ross H. Porter, Pittsburgh sales office representative, has been promoted to assistant manager of the Pittsburgh sales office, a position held by H. Melvin Carnahan, who has been manager of the Pittsburgh office since the retirement of E. H. Eggleston last year.

ROLL FORMING MACHINES AND ROLLER DIES



Also Pittsburgh Lock Machines, Pipe and Elbow, Beading, Turning Machines and all other Sheet Metal Working Machinery. Your inquiries invited.

MAPLEWOOD MACHINERY CO.
2634 FULLERTON AVE. CHICAGO 47, ILLINOIS

Duty-Designed

AUTOMATIC HEATING EQUIPMENT FOR SMALL HOMES

by Timken Silent Automatic

Announcing Two Extraordinarily Efficient Heating Units

For Warm Air Heating and Winter Air Conditioning—

THE HI-FURNACE

Designed specifically to provide small homes with a completely modern heating package, this new Timken Silent Automatic unit combines a wall-flame oil burner, furnace with radiator, blower, air filters and automatic humidifier (extra optional equipment), all in one fully-integrated, super-efficient unit.

The Same Amazing Wall-Flame Oil Burner Fires Them Both

Completely quiet and completely dependable, the famous Timken Silent Automatic Wall-Flame Oil Burner consistently saves up to 25% or more on fuel oil bills. The wall-blanketing wall-flame gives faster, more uniform heat, too.

For Hot Water Heating, Radiator and Radiant Systems—

THE HI-BOILER

The full benefits of modern automatic heating—*plus* fully automatic domestic hot water—are introduced into even the smallest homes by this remarkable unit. The single, space-conserving cabinet contains a wall-flame oil burner, heating boiler, domestic water heater, expansion tank and complete wiring and control system.

Here's your chance to *really* crack the small home market—America's *biggest and fastest growing* oil heating market!

The famous Timken Silent Automatic line now covers that rich and profit-ripe field in a way no other line can approach. Here are oil furnaces, oil boilers, water heaters Duty - Designed especially for *small* homes. Look at these remarkable new self-contained units, the Hi-Boy and the Hi-Boiler. They give you the *modern* answer to every heating dealer's prayer!

Best of all, the Timken Silent Automatic small home line is priced to put you in the best kind of a competitive position. Yes, any way you figure it, here's the top profit line today—*the Timken Silent Automatic line!*

TIMKEN
Silent Automatic
OIL HEAT

TIMKEN SILENT AUTOMATIC DIVISION
The Timken-Detroit Axle Company • Jackson, Michigan

Accepted S.A. Standard
TRADE MARK REGISTERED

OTHER UNITS IN THE FAMOUS TIMKEN SILENT AUTOMATIC LINE

OIL FURNACES

Timken Silent Automatic Oil Furnaces for larger homes give you modern winter air conditioning at its economical best. They heat, humidify, filter and circulate the air for perfect comfort always. The fuel-saving wall-flame oil burner is the heart of these units.

OIL BOILERS

Experience-designed and quality-built, the great Timken Silent Automatic Oil Boilers are unexcelled for long life—unrivaled for low-cost operation. No other comparable unit offers so many features for quiet, clean, long-lasting satisfaction.

WATER HEATERS

Here's an abundance of hot water for showers, laundry, dishes, cleaning—at only a few cents a day! Timken Silent Automatic Water Heaters, both coil type and tank type shown, come with the wall-flame oil burner.

"Well--I Started Reading Those

PREMIER Dealer Advertising Helps!"

Steel Furnaces
Cast Iron Furnaces
Winter Air Conditioners
Oil Burners
Humidifiers
Blowers

You'll find yourself closing many an unexpected sale, if you make regular use of PREMIER Dealer Advertising Helps. Find out about this brand new, expertly prepared advertising material that's provided to help YOU get more business. Find out about the many other ways in which PREMIER cooperates to promote the success of the Independent Furnace Dealer, and help him to STAY independent!

PREMIER FURNACE COMPANY

DOWAGIAC, MICHIGAN

INDUSTRY ITEMS

PERFECTION STOVE Co. of Cleveland, Ohio had added three new salesmen to the staff of its Jersey City district. They are John B. Pilette, F. Leslie Laird and Spencer F. Fearon.

J. B. Pilette F. L. Laird S. F. Fearon

Mr. Pilette has an extensive background in the educational field and accumulated considerable experience in selling heating equipment during the summer months, over the last few years.

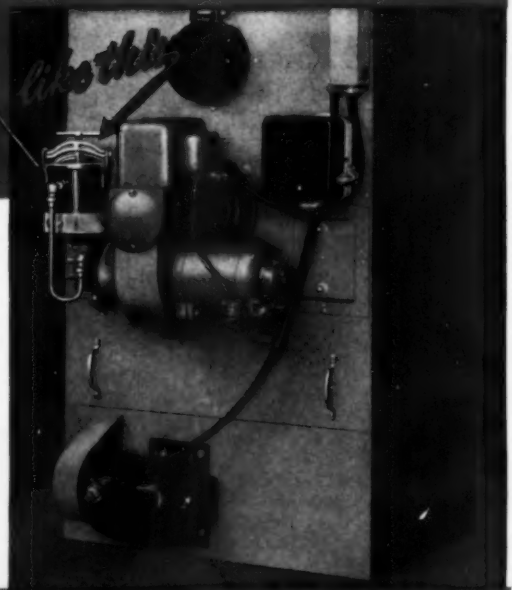
Mr. Fearon also had some experience in the educational field and for the last few years had been associated with plumbing supply houses in New England.

Mr. Laird spent 21 years with Hecht Bros., in Baltimore as a salesman and assistant buyer. During that time he sold Perfection products at retail.

The General

- Make profits on every installation.
- Eliminate troublesome call backs.
- Build regular repeat business through cartridge replacements.
- Help customers save money by giving cleaner burning fuel.
- Build goodwill and customer loyalty by providing trouble-free operation.

CAN INCREASE YOUR SERVICE DOLLAR VOLUME WITH INSTALLATIONS



***General* HAS THE RIGHT FILTER FOR EVERY OIL HEATING PLANT!**

The *General* is popular with all contractors, dealers and fuel oil service companies because it has proven the best fuel oil filter for heating plants, hot water heaters, and room heaters. The *General* will prove a profitable leader for you, too! Report after report in our files bear out these statements.

For average installations three models, DeLuxe 2A-300, Master 2A-700 and Economy 1A-25, are outstanding leaders in the *General* line because they are priced to sell easily, built to give long-lasting service, and designed to provide high-degree performance.

There is no better time than *now* in letting *General* Fuel Oil Filters increase your service dollar volume. Contact your jobber immediately or write direct for information and discounts.

Listed: Re-examination Service, Underwriters Laboratories

GENERAL FILTERS INCORPORATED — GENERAL FUEL OIL FILTER — 12890 WESTWOOD AVE. DETROIT 23, MICHIGAN

FOR NEW FURNACES

FOR FURNACE REPAIR

"Tops" IN HEAT RESISTANCE AND ADHESION . . .

THARCO has successfully withstood temperatures up to 2500° at Detroit Edison and for long periods — that's nearly 50% higher than normal warm air furnace temperatures.

THARCO seals BOTH sides of the joint — gas-tight, smoke-tight — yet it's resilient enough to care for all normal expansion and contraction . . . and, Mister, it STAYS PUT **permanently**, thanks to the secret Armstrong formula!

THARCO Asbestos Furnace Cement comes in 1-lb. to 350-lb. metal containers — **ready to use.** See your jobber, or write us today for complete information.

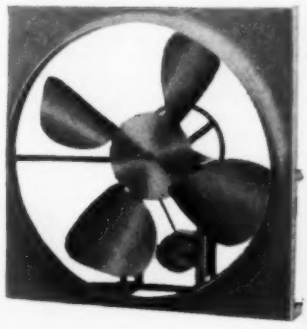
THE ARMSTRONG COMPANY

4065 SO. LA SALLE STREET, CHICAGO
241 SO. POST AVENUE, DETROIT
319 SO. CROWDUS STREET, DALLAS

Get the Profits You Missed Last Summer

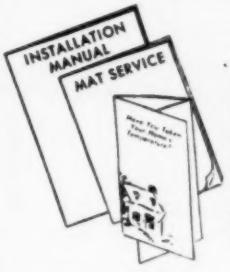
INSTALL MURRAY ATTIC FANS NOW

"The Fan that does its work in a Whisper"



Selling Murray Attic Fans can mean year-round profits for you. Now is the time to follow up last summer's inquiries, to follow leads from satisfied installations. Every new construction, every remodeling job is a potential sale for Murray Attic Fans. Homes, offices, stores need Murray Attic Fans.

The Murray Attic Fan does its work in a whisper, gives trouble-free operation, is easy to install, can be financed through FHA, assures you satisfied customers. For extra profits in your business — install Murray Attic Fans *now*.



***MURRAY SALES INCREASERS KIT:** Includes Installation Manual, Newspaper Mats, Consumer Folders, Radio Announcements. Add to your profits by using this pretested sales material. Available free to Murray Attic Fan dealers. Write today.*

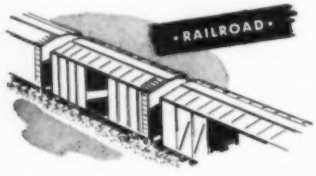
THE MURRAY COMPANY OF TEXAS, INC.

DALLAS, TEXAS ATLANTA, GEORGIA

here's how
ZINC
SERVES YOU

Galvanizing (Zinc coating) insures long-time, low-cost service . . . protects property . . . saves money. For as long as iron or steel is coated with Zinc, *it cannot rust!* For satisfaction, use galvanized materials . . : they're "Sealed-in-Zinc" against rust.

TIME proves galvanized sheets stay stronger longer. Used as roofing and siding, they give buildings the "strength of steel" . . . the rust protection of Zinc. The "Seal of Quality" (above) is your guide to economy in buying galvanized sheets. It means they carry at least 2 oz. of Zinc per sq. ft. Galvanizing also lengthens fence life and service.



Galvanized products in railroad industry guard bridges, buildings, cars., etc., against rust.

Strength, workability and resistance to heat as well as rust, make galvanized sheets ideal for heating and air-conditioning.

FREE BOOKLETS

Fully illustrated and packed with practical information on galvanized sheets and Metallic Zinc Paint. Send for these *free* booklets, *today!*

AMERICAN ZINC INSTITUTE
35 East Wacker Drive, Chicago 1, Ill. Rm 2614

Send me without cost or obligation the illustrated booklets I have checked.
- ☐ Repair Manual on Galvanized Roofing and Siding
- ☐ Facts about Galvanized Sheets
- ☐ Use of Metallic Zinc Paint to Protect Metal Surfaces

Name_____

Address_____

Town_____ State_____

INDUSTRY ITEMS

WILLIS G. PENNINGTON has joined the sales staff of Dole Valve Co., of Chicago, Illinois. Mr. Pennington has been in the heating industry for several years and has recently been associated with Automatic Devices Co. and Peerless Mfg. Co. Mr. Pennington will handle sales and promotional activities for Dole in the Chicago area in connection with marketing the new Dole automatic register for forced warm air heating.

W. G. Pennington

Alfred Greulich

ALFRED GREULICH has been appointed a representative for Skuttle Mfg. Co., and has a territory that includes the state of Michigan and the city of Toledo, Ohio. After his return from service he became a division foreman and last February began representing the company in Michigan.

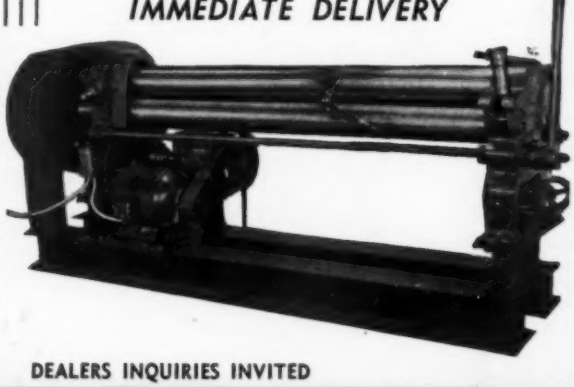
FOR THAT PERFECT
ROLL
IN SHEET METAL

THE NEW 6" DIA.

MILTON
SLIP ROLL FORMING MACHINE

Rolls Manufactured 1" to 6" in diameter... to 10' length. Handles up to ¼" capacity. Hand or Motor Driven Models

IMMEDIATE DELIVERY

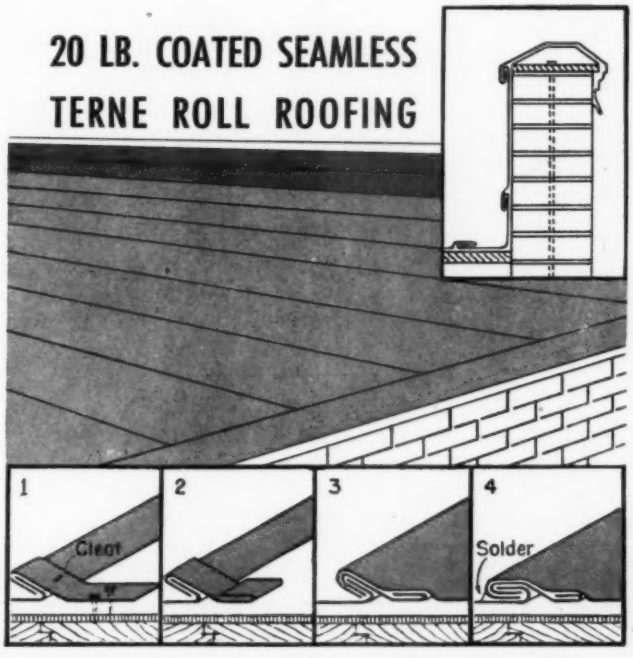


DEALERS INQUIRIES INVITED

MILTON EQUIPMENT CO.
402 Race St. Phila. 6, Pa. WA Inut 2-1734

flat seam roof without cross-seams using FOLLANSBEE

20 LB. COATED SEAMLESS TERNE ROLL ROOFING

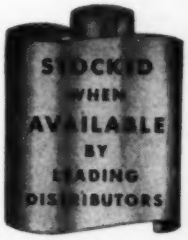


Follansbee Seamless Terne Roll Roofing applied to flat seam roof

Elimination of cross-seams is just one of the advantages of using Follansbee Seamless Terne Roll Roofing on your repair and maintenance contracts. But it's an important advantage because it speeds up installation and saves material—protects the profit margin.

The 50-foot rolls of Follansbee Seamless Terne Roll Roofing are easy to handle and can be readily cut to any required length, right on the job.

There are other features you'll find worthwhile, too, when you use Follansbee Seamless Terne Roll Roofing on your next contract.



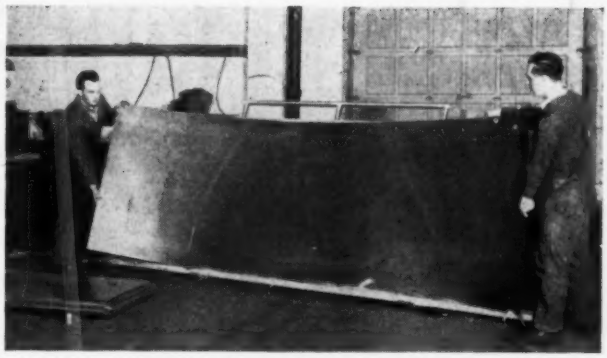
FOLLANSBEE STEEL CORPORATION

GENERAL OFFICES • PITTSBURGH 30, PA.

Sales Offices—New York, Philadelphia, Rochester, Cleveland, Detroit, Milwaukee. *Sales Agents*—Chicago, Indianapolis, St. Louis, Kansas City, Nashville, Houston, Los Angeles, San Francisco, Seattle; Toronto and Montreal, Canada. *Plants*—Follansbee, W. Va., and Toronto, Ohio.

FOLLANSBEE METAL WAREHOUSES: Pittsburgh, Pa. Rochester, N. Y., and Fairfield, Conn.

COLD ROLLED STRIP • POLISHED BLUE SHEETS • ELECTRICAL SHEETS
SEAMLESS TERNE ROLL ROOFING

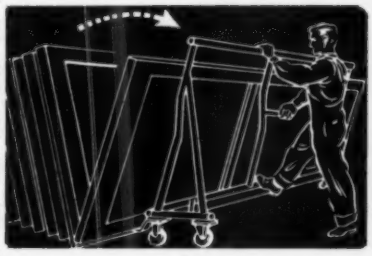


Unloading sheet metal from a Rol-Away truck is a simple matterless labor, less room, less damage.

The ROL-AWAY

The Easy Way to Handle Sheet Metal and Tubing

Specially designed for handling long flat materials, Rol-Away is a natural for working with sheet metal and metal tubing. Whole crates can be loaded at one time and taken off as used, thereby saving floor space. These lightweight aluminum trucks come in three models with capacities of 2400 to 3000 pounds. The jumbo Rol-Away is especially adaptable to fire doors, extra large steel sheets and oversize crates. Easy-to-operate, Rol-Away does a job that would normally take at least three or four men.



ONE MAN OPERATION

Rol-Away operation is a simple, easy one-man job. Truck is tilted forward so loading blades can be inserted under load. Truck is then tilted back into level position and load is ready to roll in any direction.

Send for Illustrated Folder

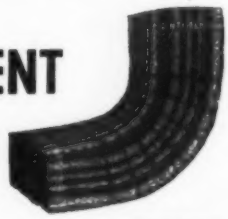
BEALL Pipe & Tank Corp.

1945 N. Columbia Blvd., Portland 3, Oregon

Rol-Away's newest truck specially designed for handling pipe, tubing, bar stock moulding and other long loads. Frame of sturdy aluminum tubing. Capacity, 2000 lbs. Stretcher below for holding packages makes it ideal for filling orders.

CINTI ELBOWS

...NEW EQUIPMENT *brings you* FINER ELBOWS



There's only one way to stay out in front in any field and that's to supply the *best available merchandise.* The Cincinnati Elbow Co. with its new automatic equipment has earned this reputation among aggressive sheet metal men.
Use Cinti Elbows on your next job . . . you'll find them easier to work with and hot-dipping after forming makes them more durable.

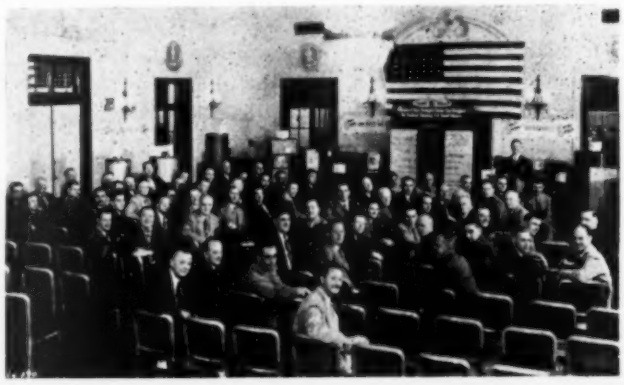
Ask Your Jobber for Them

The Cincinnati Elbow Co.
2627 Colerain Avenue
Cincinnati 14, Ohio

INDUSTRY ITEMS

ANOTHER SERIES OF THREE DEALER MEETINGS was held by York-Shipley, Inc., manufacturer of York-Heat automatic heating equipment, in Newark, N. J., New York City, and Utica, N. Y. recently. More than 250 distributors and dealers attended the sessions.

The program centered around "The York-Heat Story," a slide film presentation of the company's products,



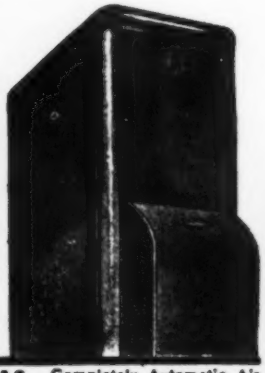
policies, merchandising plans, and dealer program, and a discussion of current merchandising problems.

Mitchel Landau, assistant to the president of York-Shipley; George Athana, New York district manager; and John R. Adams, advertising counsel, conducted the program. Distributors were host with York-Shipley at luncheon preceding the meetings.

WHEN YOU THINK OF HEATING EQUIPMENT—

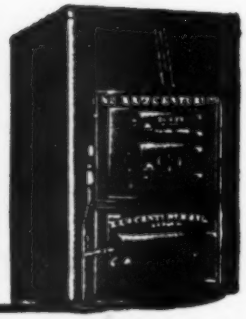
Remember
XX CENTURY
ZEPH-AIR

With It's 54 Years of Engineered Efficiency in The Heating Field



OIL Quiet, Economical, Space Saving, Zeph-Air Oil Burning Furnaces, Easy To Operate, Easily Installed.

GAS Completely Automatic Air Conditioned Gas Furnaces With The Famous Gear Shaped Cast Iron Radiation Surfaces.



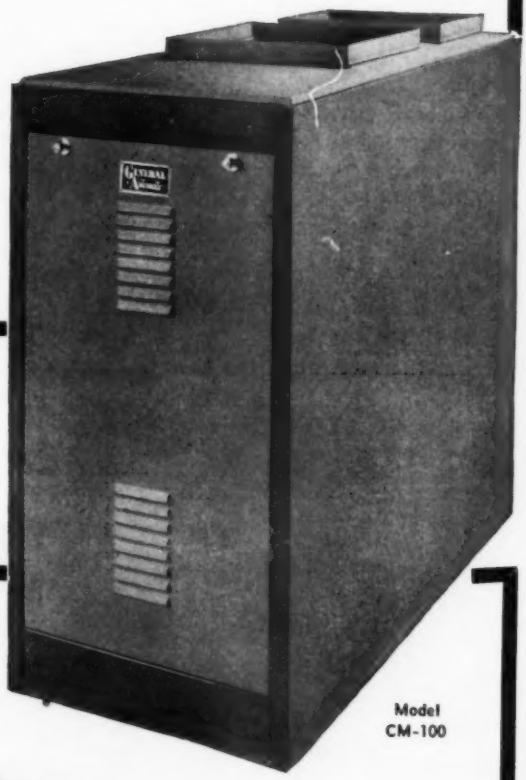
COAL You Buy Quality In Zeph-Air Coal Furnaces. No Costly Service Calls To Worry About.

It Pays To Push Zeph-Air Heating Products — Thousands of Satisfied Users All Over The Country Remember The Dependability And Reliability Their Zeph-Air Furnaces Stand For.
When a Zeph-Air Furnace Has Ended Its Long-Life and Is Ready To Be Replaced — The Customer is Almost Sure To Say — "Years of Uninterrupted Service," "Install Another Zeph-Air."
Cash In On This 54 Years of Customer Satisfaction — Stock Up On Zeph-Air Heating and Weather Conditioning Equipment — Now.

THE XXTH CENTURY HEATING & VENTILATING CO.
96 IRA AVENUE AKRON, OHIO

MORE AND MORE

✓ DEALERS
Check - Up
then
Sign - Up



Model
CM-100

One
Reason Why

is the compact, easy to install, easy to service Winter Warm Air Conditioner. Made in 4 sizes—85,000 - 100,000 - 150,000 - 300,000 BTU's per hour. A real profit builder that satisfies customers. Find out about this reason why . . . and the many other burners and furnaces that make so many dealers who check up . . . sign up.

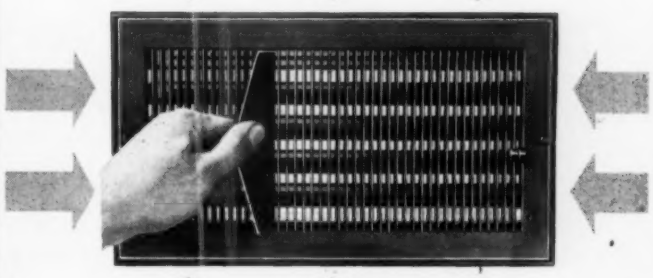
GENERAL
Automatic

Checks first . . . with the finest

GENERAL OIL BURNER CORPORATION
2300 Sinclair Lane, Balto. 13, Md.

U S *America's Favorite* REGISTERS

Run Your Ducts From Any Direction



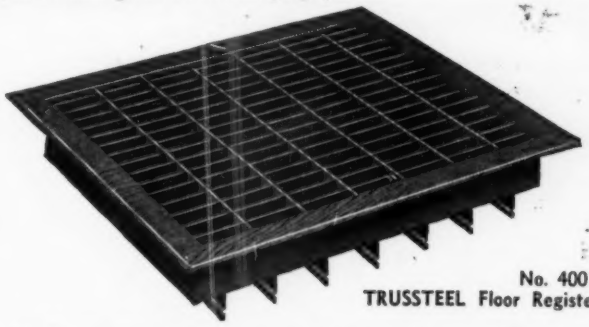
Top - Sides - or Bottom

Nothing Obstructs the Air-Flow

**U. S. NO. 256 4-WAY FLOW
AIR-CONDITIONING REGISTER**

This is the *most versatile of all* Air Conditioning Registers. Wherever you put it, sidewall or ceiling . . . however you run the approach—from top, left, right, bottom or *back*—there is nothing in its multiple valve construction to interfere with the air-flow. That's because the valves are part of the register body and cannot swing into or impede that air-flow. These valves also give you control of the up or down deflection of the air, while the easily-set grille bars control left or right directional flow.

Keep this *VERSATILITY* in mind in ordering Air-Conditioning Registers. Save installation time, cut inventory needs. Standardizing on U. S. always pays.



No. 400
TRUSSTEEL Floor Registers

The complete U. S. line also includes this masterpiece of floor registers. It's heel-proof. Valves run *short* way for easier operation and stain-free walls.

Send for latest Catalogs and price list.

UNITED STATES REGISTER CO.
BATTLE CREEK, MICHIGAN
MINNEAPOLIS • KANSAS CITY • ALBANY

NEW and EXCLUSIVE

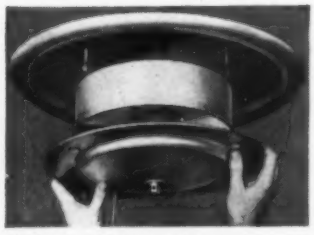
The quick-opening set-lock assembly on the Kno-Draft Air Diffusers

Cuts installation and maintenance time

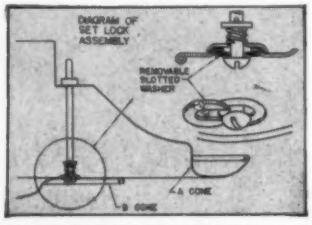
Instant Cleaning and Inspection: With the new Type HD set-lock assembly, the inner element of the Kno-Draft Adjustable Air Diffusers can be quickly removed and reinstalled while the diffuser is in place without affecting its adjustment.

1. Remove cover cone (if used).

2. Press cone—slip out washers.



3. Remove inner element.



Now standard equipment.

It takes but a minute—requires no tools

The "B" cone or inner element of the diffuser is secured to the combined suspension and adjustment screws by a springloaded catch which is kept in compression by a slotted washer. The holes in "B" cone pass over the bolt heads. Just press up on cone "B" and insert or remove the slotted washers.

FREE HELPFUL LITERATURE

☐ **Bulletin K-21:** Details on Type HD Set-Lock Assembly.

☐ **New handbook on air diffusion:** Shows how to create "custom-made" air patterns and eliminate drafts.

W. B. CONNOR ENGINEERING CORP.
Dept. J-105, 112 East 32nd Street, New York 16, New York
Please send me the free literature I have checked above.

Name .....

Company .....

Street .....

City ..... Zone ..... State .....

W. B. CONNOR ENGINEERING CORP.
Air Diffusion • Air Purification • Air Recovery
112 East 32nd Street CONNOR New York 16, N. Y.
IN CANADA: Douglas Engineering Co., Ltd., 190 Murray Street, Montreal 3, P. Q.

JOSEPH T. RYERSON & SON, INC., steel distributors, have published a 12 page, illustrated booklet that gives a quick, picture story of their new San Francisco Bay area steel service plant, located in Emeryville, California. This new plant is the second in California and began operations in March of this year. The booklet traces the history of the company and illustrates and describes the services offered by the Emeryville plant.

Kruckman— Washington Letter

(From page 71)

month by voluntary allocation beginning with July 1, to end with March 1, 1949. The agreement covers manufacturers of warm air furnaces, including jackets and casings, registers and grilles, flue-connected floor and wall furnaces, furnace blowers, furnace pipe, fittings and duct work. The sheet metal contractors, speaking for 10,000, asked for 230,000 tons of sheets. The voluntary allocation for warm air furnaces, in addition to steel, also included an additional quantity of pig iron for castings to come out of a total of 114,000 tons monthly, set aside for new housing, and for essential maintenance and repair for the period between July 1, 1948, and March 1, 1949. To find out where steel is now distributed, how much is distributed, and to whom the steel goes, the Senate Small Business Committee has sent a questionnaire to the 15 major steel-producing companies of the nation. The information will cover distribution of steel by geographic areas, to

PROFIT NOW!

WITH

GRAND RAPIDS FURNACE CLEANERS

It's easy to get a lion's share of furnace cleaning profits when you use a Grand Rapids Furnace Cleaner. Greater cleaning capacity, handling ease and practically designed groups of furnace cleaning attachments help you give better service and clean more furnaces per day at a higher profit.

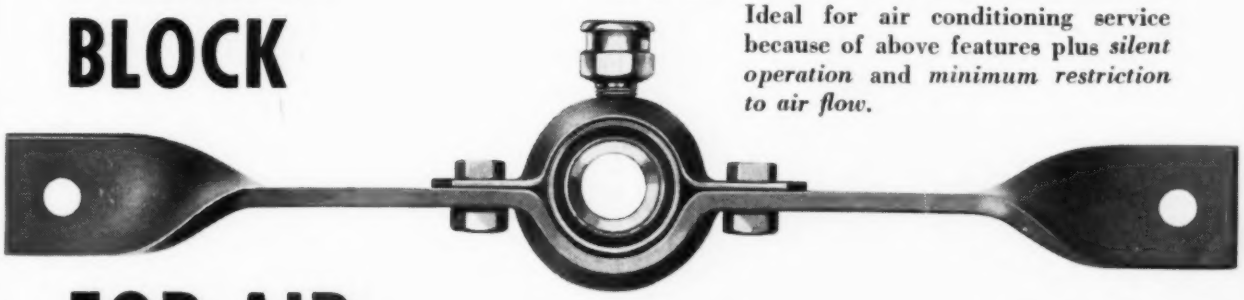
Act now! Write today for complete information and prices.

DOYLE VACUUM CLEANER CO.
227 Stevens St., S.W. Grand Rapids 7, Michigan

THE IDEAL PILLOW BLOCK FOR AIR CONDITIONING

UNIQUE engineering encloses Bushing, Cushion and Sealed Oil Reservoir in compact pressed steel ball. Perfect self-alignment through ball and socket action. Built-in oil-proof synthetic rubber cushion absorbs vibration. Porous bronze bushing, wick fed from large oil chamber, insures long-time lubrication.

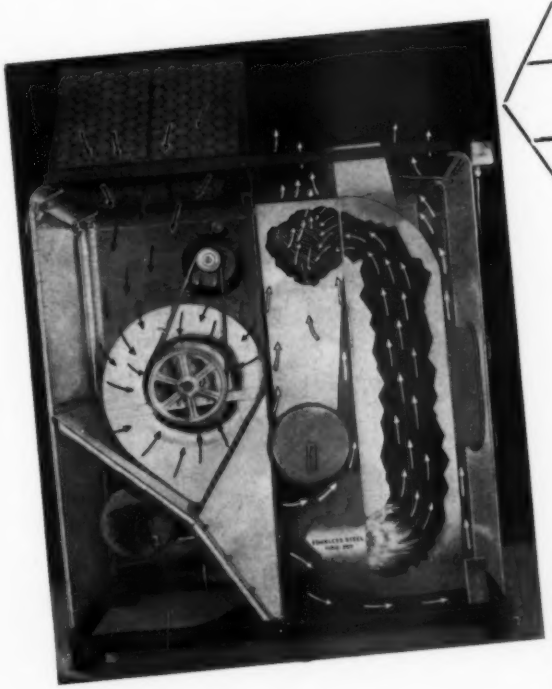
Ideal for air conditioning service because of above features plus *silent operation* and *minimum restriction to air flow.*



This bridge tree is one of several types of mountings. We are glad to cooperate with engineers in designing mountings to meet their specific needs. Tell us your problems and we will send illustrations, specifications, and complete information.

TRIANGLE MANUFACTURING CO.
392 Division Street Oshkosh, Wisconsin

COMPLETE CUSTOMER SATISFACTION!
when you install TJERNLUND QUICK HEAT
PERFECTED WINTER AIR CONDITIONING



HERE'S THE INSIDE STORY!

Satisfied customers build sales. It's particularly true in this field where purchases may run into hundreds of dollars and poorly installed jobs or unreliable equipment can prove costly to your reputation and subsequent business opportunities.

Take a look at this cutaway view of Quick-Heat—it shows a modern, highly efficient heating plant in operation. The air is drawn through the filters and forced around the entire heating unit including the "counter-flow" heat extracting flues. This results in complete air wipeage of all heating surfaces and clean, comfortable heat for many years.

The Tjernlund line will meet your needs for any installation . . . investigate today. We make them to satisfy.

TJERNLUND MANUFACTURING CO.
2140 Kasota Ave., St. Paul 8, Minn.

ON CHIMNEYS AND VENT FLUES

Breidert Air-X-Hausters

(PAT. NO. 2269428)

Breidert Air-X-Hauster Chimney Top makes fireplace draw better.

the first scientific improvement in roof ventilators in over 50 years!

Type B Breidert Air-X-Hauster for factories, commercial and residential buildings.

No matter which way the wind blows, no matter how bad the weather—the Breidert *provides positive exhaust.* Designed in accordance with the science of aerodynamics, this revolutionary ventilator utilizes the power of air currents coming from *all angles* to provide safe, positive ventilation without back-draft. Stationary—no moving parts to regulate or get out of order... no power consumption... compact and pleasing in appearance.

Breidert Air-X-Hauster—the first ventilator to be tested under all variable vertical and horizontal wind conditions... with certified ratings published.

Unlike most conventional ventilators which work efficiently only when wind strikes in a horizontal plane, the Breidert has been thoroughly tested—by U. S. Navy and Smith Emery Commercial Testing Laboratories—with the wind blowing in *all* directions. Its remarkably high performance ratings under all conditions are *certified and published.*

Many Thousands in Use all over the Country

Breidert Air-X-Hausters have found wide acceptance among architects, engineers, industrialists, farmers, home owners, ship and boat owners, U. S. Army, U. S. Navy, Maritime Commission, schools, institutions and public buildings. In every case when properly installed, the Breidert has never failed to fully meet every claim made for it!

Free Engineering Data Book, with complete specifications, sent on request. Address

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Representatives in 50 principal cities throughout the United States

affiliated steel-consuming companies, and to affiliated warehouses, independent jobbers and dealers. Those asked to supply the data are U. S. Steel, Bethlehem, Republic, Jones and Laughlin, Youngstown Sheet and Tube, National, Inland, Armco, Colorado Fuel and Iron, Pittsburgh Steel, Granite City Steel, Sharon Steel, Wheeling Steel, Follansbee Steel, and Alan Wood Steel. The figures are requested for 1940 and 1947. Data are requested on hot rolled and cold rolled sheets; hot and cold rolled strip; hot and cold rolled bars; buttweld, lapweld, and seamless pipe; electric weld and mechanical and pressure tube.

Distribution Survey

This survey is regarded as the most sweeping sales and distribution data ever asked by the Government. The steel companies surveyed make more than 80 per cent of the nation's steel, and make the bulk of the type of carbon steel products in shortest supply. The information is expected to be in the hands of the Committee by October 15. The facts are to be used as the basis of the report which will outline the quantities and the types of steel to be allocated voluntarily to the users of sheet metal as well as to those who use other steel. The government assumes the production of finished steel this year will total 66 million tons. The production next year is estimated at 69 million tons. There also is a well established conclusion among most government people that our steel production should be at least 80 million tons. They feel that the U. S. population of 145,000,000 justifies such volume. It is felt

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You're sure of silent service, for the life of the equipment, when you install Randalls. Only Randall Pillow Blocks have the *double*, oil-plus-graphite lubrication that keeps shafts running smoother . . . quieter . . . *longer*.

STREAMLINER—One-Piece Steel Housing . . . formed around self-aligning ball. Reduced cross section area gives maximum air-flow. One of eight types of *double-lubricated* pillow blocks in the complete Randall line.

The right Randall costs no more. Write for Catalog 47 with data on the complete Randall line.

Randall Graphite Bearings, Inc.

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Above: Peerless *Oil Master* with side panels removed to show radiator, filters, blower, combustion drum and final heating chamber. Separate vestibule for oil burner.

At Right: Peerless *Oil Master* with panels in place. Note compactness.

More *comfort* for customers —more *profit* for you with

Peerless Oil Master

Here's the compact, economical oil furnace that gives your customer the utmost in automatic heat for cold-weather comfort and year-around convenience. It's the Peerless *Oil Master*, with exclusive baffle design that sends billows of clean, cheery, *filtered* heat through every register. Ruggedly built for years of efficient, low-cost service. Write for full details on the tremendous profit potential that is yours when you sell the Oil Master and the complete line of Peerless furnaces, and Repair Parts.

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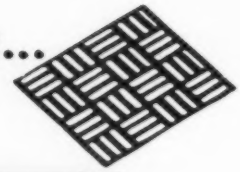

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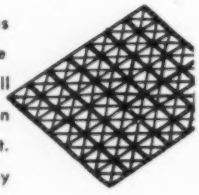
Useful as well as ornametal, **H & K Grilles** supply the finishing touches to a complete architectural pattern. Back of their overall beauty, there's the functional consideration of safety plus access to hidden equipment. These perforations ARE important; that's why specifying "Grilles by H & K" assures you of outstanding workmanship with a wide variety of designs and materials.



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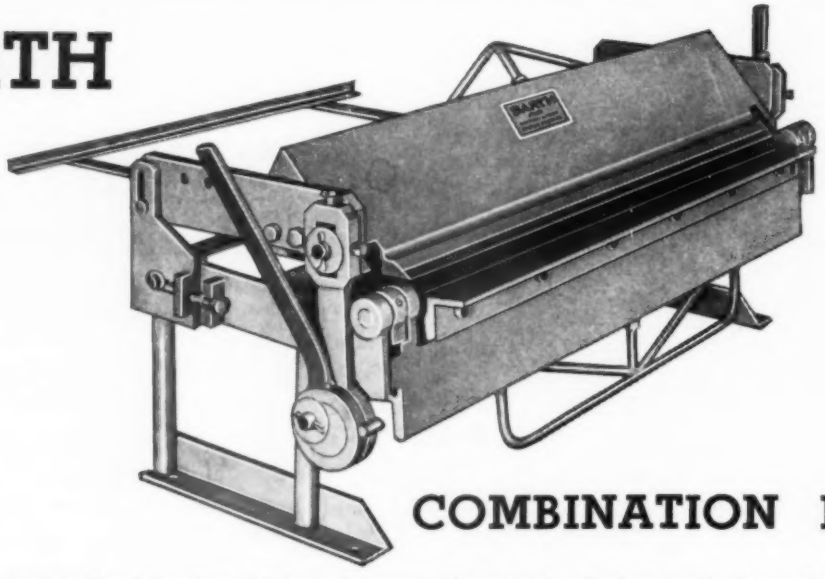
there will be a steady and expanding demand for steel in that quantity. Apparently some action will be taken to agitate the establishment of resources to produce 80 million tons or more per year. It is believed that the steel industry concurs in this opinion, but the producers are waiting for the time when costs will come down before embarking upon expansion. Over one million tons are being produced this year beyond all previous supplies, but no one seems to be able to determine where the added quantity goes.

The survey now in progress also is expected to enable the Committee to indicate to the Office of Industrial Cooperation how it may establish voluntary allocation among the farm equipment industry group. This group established its industry advisory committee last January. The members of the committee represented 42 firms. Only two of the delegates were representative of smaller firms. The dominant members insisted the industry was in receipt of sufficient steel. This precipitated a tremendous row. John Harvey, of the Kramer Company of Leavenworth and Topeka, Kansas, a firm almost 100 years old, the chief manufacturer of the nation's supply of cornpickers, fought for more steel, insisting that over 300 smaller firms in his area alone were on the point of dissolution because they could not obtain steel. Before another meeting could be held, Harvey was fired from the committee as an obstructionist.

The committee made a formal report in which it advised the Secretary of Commerce that the industry had an adequate supply of steel. So many complaints came into the offices of the Senate Small Business

BARTH



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Construction is of all steel with upper and lower jaws and the bending apron reinforced with angle truss stiffeners.

Write us for details concerning our complete line of Sheet Metal Working Machines.

THE BARTH MANUFACTURING CO., Milldale, Conn.

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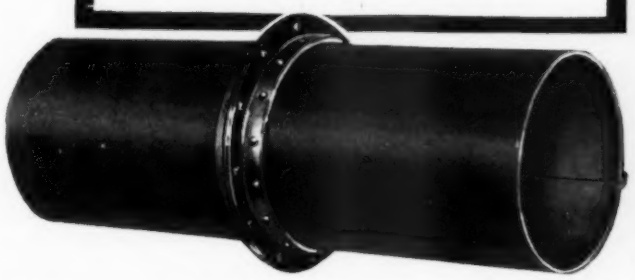

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Get a better sheet metal pipe assembly faster, easier, at lower cost with Chicago Metal Mfg. Co.'s Steel Angle Rings. They fit securely, have a flat surface that assures a tight joint and are accurately rolled to a true circle. Available in standard sizes 6″ I.D. to 36″ I.D. Larger size Angle Rings — also tees, channels, rods, bars, rounds and shapes — rolled to your specifications.

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Converts to Burn Any Type of Fuel with Top Efficiency

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Complete line of Wesco Heating Equipment from 80,000 to 800,000 BTU capacity.

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Portable ELECTRIC RADIATOR

A BIG FALL AND WINTER PROFIT BUILDER!

Continued fuel shortages will keep electric auxiliary heaters in strong demand this fall and winter. So be wise . . . be ready with America's finest portable room heater—the CO-Z-AIR.

In the CO-Z-AIR Portable Electric Radiator you get the features that make selling easy—smart style, high efficiency, greater safety (no water, steam or exposed heating elements), economy, and many more. And you'll be backed by . . .

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Committee that it held hearings and sent out its investigators. In August the Committee made its report. It came to the conclusion that the industry, particularly the smaller manufacturers of farm equipment, were rapidly closing down for lack of steel. The average reduction in steel supply ranged from 4 to 9 per cent. Senator Wherry formally cited the difficulties to Secretary of Commerce Sawyer. He asked the Secretary to direct the Office of Industry Cooperation to fire the present personnel of the Industry Advisory Committee, and to re-establish it with new personnel. Late in September Secretary Sawyer advised the Senator that a new committee would be appointed, and asked that the Senate Small Business Committee suggest names for consideration as members of the rehabilitated committee. It is very likely that John Harvey will be on the top of the Senate list.

Incidentally, John C. Virden finally resigned as Director of the Office of Industry Cooperation, leaving on September 1. His successor is Earl W. Clark, who established the office, and who has a fine record of winding up the affairs of several wartime agencies. Clark is now Acting Director, a step which invariably precedes permanent appointment. It also is an open secret in the Capital that Secretary Sawyer will leave the Commerce Department on January 1, 1949, regardless of election results. His determination to leave is genuinely regretted in Washington. He has given the Commerce Department a very business-like and intelligent administration, without much ballyhoo or fanfare. He is regarded as great improvement over his two predecessors.

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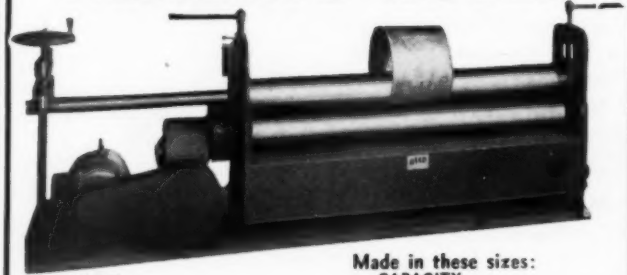
REED Series 650
PYRAMID TYPE — ALL STEEL
BENDING ROLLS



MODEL	Made in these sizes: CAPACITY
654	4' x 7/16" PLATE
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Here's the roll of a thousand uses, for both job and production shops. Featuring all steel construction, bronze bearings and totally enclosed *silent* worm gear drive, this bending roll gives high roll clearance between top and bottom rolls for rolling of heavy bars and small structural shapes. Lower rolls are closely spaced to minimize flat spot at seams.

Built with 7½" Dia. top roll and 6½" Dia. lower rolls.
Comes complete with motor and reversing control ready to operate.

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Save yourself TIME *and* MONEY

Order Furnace Fittings from

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NO JOB can be better than the fittings you use and no fittings can be better than ours. We've always made a conscientious effort to supply the finest fittings and get them out to our customers with a minimum of time and trouble.

You'll find that dealing with us will be a pleasant and profitable experience. We have a complete line of fittings and accessories to meet your every need and we're sure you'll agree that one order will lead to many more.

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Here's a time and material saver for speedy and air tight installations of trunk line and wall stack fittings with all the "Know How" of years of experience in the manufacture of precision "Made-Rite" fittings. Write for complete details today and you will receive our prompt attention.

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ECON-O-COL COAL BURNER
THE SHIELD OF QUALITY

ECON-O-COL
The "Stronghearted" Stoker
BUILT BY COTTA TRANSMISSION COMPANY • ROCKFORD, ILLINOIS

WRITE FOR DETAILS OF THIS COMPLETE LINE OF PRECISION-BUILT, HIGHEST-QUALITY STOKERS

Roberts—

(From page 94)

topflight supervision and maintain adequate job costing records.

Overhead cannot be computed with dollars-and-cents accuracy when it is costed on estimates or computed on finished jobs. Many contractors and dealers do not understand this and it accounts for mystifying losses, such as the query which leads off this article implies. You can figure overhead to the penny on your financial accounts, which are the records from which you pay your bills for rent, light, insurance and other overhead outlay, but when you have to allocate a portion of this money to each job as it comes in, so that you can get your overhead expense back from customers, then it is more complicated than simple arithmetic. You have sales volume, prime cost or the time factor, the labor-hour, to splice into the computation and these are variables that lack the mathematical accuracy of multiplication or addition, and so, they create distortions at times that must be watched carefully to assure reimbursement of the overhead you pay out.

Seltz—

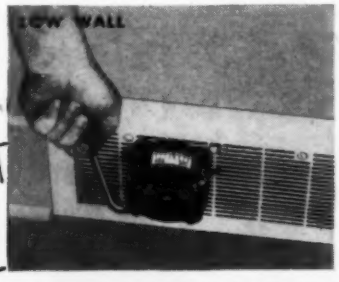
(From page 76)

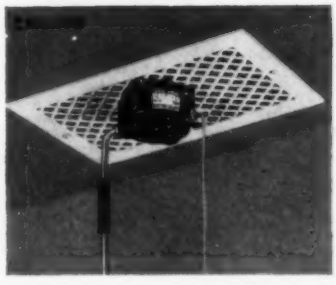
may have noticed some small print on top of the list and inquired about its meaning. The salesman quieted his fears, telling him it merely referred to the 25 per

AIRITE Direct-Reading AIR VELOCITY METER

REPRODUCTION OF SECTION OF SCALE IN INSTRUMENT
Actual size, and as it would appear if straightened out

RANGE—0-1000 FT./MIN.
20 FT./MIN. SCALE DIVISIONS





8" SCALE—Widest Scale of Any Mechanical Air Velocity Meter Ever Designed!

The AIRITE is an unsurpassed sales and service aid in heating, ventilating and air conditioning work. On installation and service work it is used to determine velocity and direction of air flow from registers and grilles for the purpose of checking rate of air delivery, balancing the system and adjusting deflecting vanes and louvers of registers so as to obtain "draft free" air distribution. These tests cut installation and service time, prevent expensive call-backs, and promote customer goodwill. The AIRITE is equally helpful for selling new equipment or modernization. It can be used in many ways to convincingly demonstrate discomforts and inefficiencies of a worn-out or inadequate system.

The AIRITE is entirely self-contained. It has no hose or probe, and gives all readings required for heating, ventilating and air conditioning work. The detachable handle facilitates use of the AIRITE at low wall or high side wall registers. By screwing a ⅛" pipe into the handle the AIRITE can be conveniently held against ceiling grille.

The AIRITE is equipped with a unique scale lock which makes it possible to retain the reading until the lock is released. For ceiling grille readings, this lock is easily manipulated by means of a piece of string. This feature makes the AIRITE exceptionally adaptable for indicating air velocity in hard-to-reach or dimly lit locations.

Dealer's Net Price *with leatherette carrying case* . . . **$19.80**

Ask your jobber for the AIRITE or write for Leaflet 749.

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IMAGINE! A good-looking, complete, compact, fully automatic, safe gas fired heating plant that requires no floor space — NO firing attention!

Yes, more and more smart owners of modern businesses and factories are installing these economical, efficient Palmaires. And NO wonder! Here's where ceilings pay dividends while floor space makes profits. There's no dirt, no fuss—expensive boiler room drudgery is completely eliminated.

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Of course AGA approved for all type gasses.

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We are Distributors____ Dealers____
Please send sales details on Palmaire heaters.

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THREE-PHASE* WELDING

at the Metal Show

A "must" on your list of things to see at Philadelphia is Sciaky THREE-PHASE Welding! You'll see why scores of fabricators depend upon THREE-PHASE... for reasons like these:

- Aluminum, brass, heavy steel plate, etc., can be welded with ordinary power facilities —because it requires *only ¼th the current* used by conventional welders.
- Power companies are happy to supply current to a *balanced* three-phase load that operates at *better than 85% power factor.*
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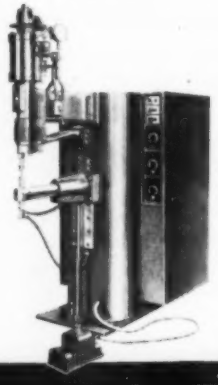

If you can't attend the show, we'll be glad to send you descriptive literature about THREE-PHASE Welding. Write on your company letterhead to: Sciaky Bros., Inc., 4907 W. 67th St., Chicago 38, Ill.

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SCIAKY

cent commission the agency received on collected accounts. If Mr. Bolton tries to read it he finds the words of a vague, general import that, at the time, are meaningless to him.

The salesman departed after assuring Mr. Bolton that the crew of adjustors will be in the territory in about two weeks. As a rule, however, things happen even quicker. In about a week the agency is busy with demands for payment. However the demands are not made by courteous adjustors. They are curt, threatening letters stating that the accounts have been "assigned" to the agency. Debtors are told that they must pay at once to avoid heavy court costs, attachments, garnishments, negative publicity, etc. In addition they are specifically instructed to pay the agency. If they reply that they would rather pay the man with whom they did business, they are warned against doing so and told the accounts no longer belonged to him.

Mr. Bolton protests to the agency. If the agency deigns to answer him at all, it refers him to the contract he signed. If he insists he signed no contract, the agency may oblige by sending him a copy. Only then does he realize how legally binding is the small print—which he didn't understand at the time—and beneath which he placed his signature.

The contract states that the agency is not responsible for any statements made by the salesmen. It also specifies a "MINIMUM" fee of fifty cents on each account. Since the amount of this minimum fee is discretionary with the agency they may charge as

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MODERNAIRE OIL-FIRED

Winter Air-Conditioning Units

NOW READY FOR DELIVERY

also

Fittings • Registers • Sundries

REPAIR PARTS

for.. Stoves • Furnaces • Boilers

YOUR COMPLETE HEATING NEEDS CAN BE FILLED BY BUYING AT—

DES MOINES
STOVE REPAIR COMPANY

DES MOINES, IOWA

SINCE 1869

Comfort for Customers . . . Means CASH for YOU

WITH REX AIR-PAK BLOWER FILTER UNITS

40,000 to 400,000 REGISTERED B.T.U. PER HOUR.

Air CONTROLS INC

DIV. OF
THE CLEVELAND HEATER CO.
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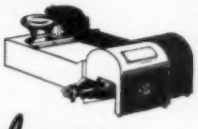
BUILT TO SATISFY EVERY NEED PERFECTLY

TOP COMFORT—and economy—come with blower filter units that fit customers' needs perfectly. With delivery ratings that range from 40,000 to 400,000 register b.t.u. per hour, REX AIR-PAK Blower Filter Units meet individual air movement requirements so accurately that costs of heating systems are at a minimum.

Right *now*, at the start of the heating season, is the ripe time to sell forced warm air heating. Cash in with the best—the finest in blower-filter units. The REX AIR-PAK line! Sell your customers not only the comfort of REX AIR-PAK controlled circulation of heated, filtered, forced air for Winter Air Conditioning . . . sell them the economy of fuel saving, too!

The REX AIR-PAK line's many improvements in design not only permit low-cost installation, but insure low operating costs and long, trouble-free service. Write today for Catalog No. 253 for detailed information.

Certified



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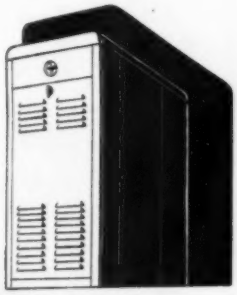

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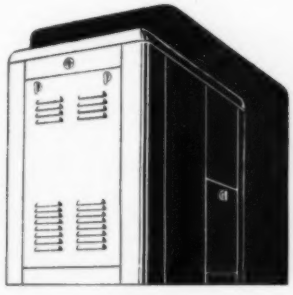
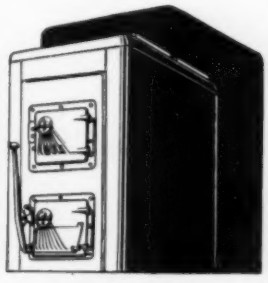


Certified oil fired forced air furnace



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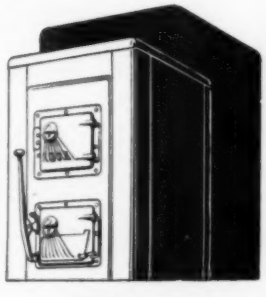
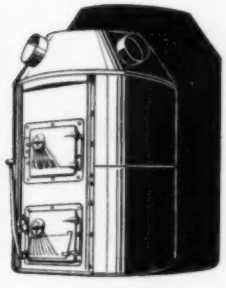
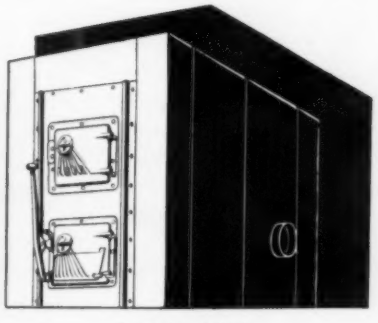


Certified coal fired gravity furnace, square



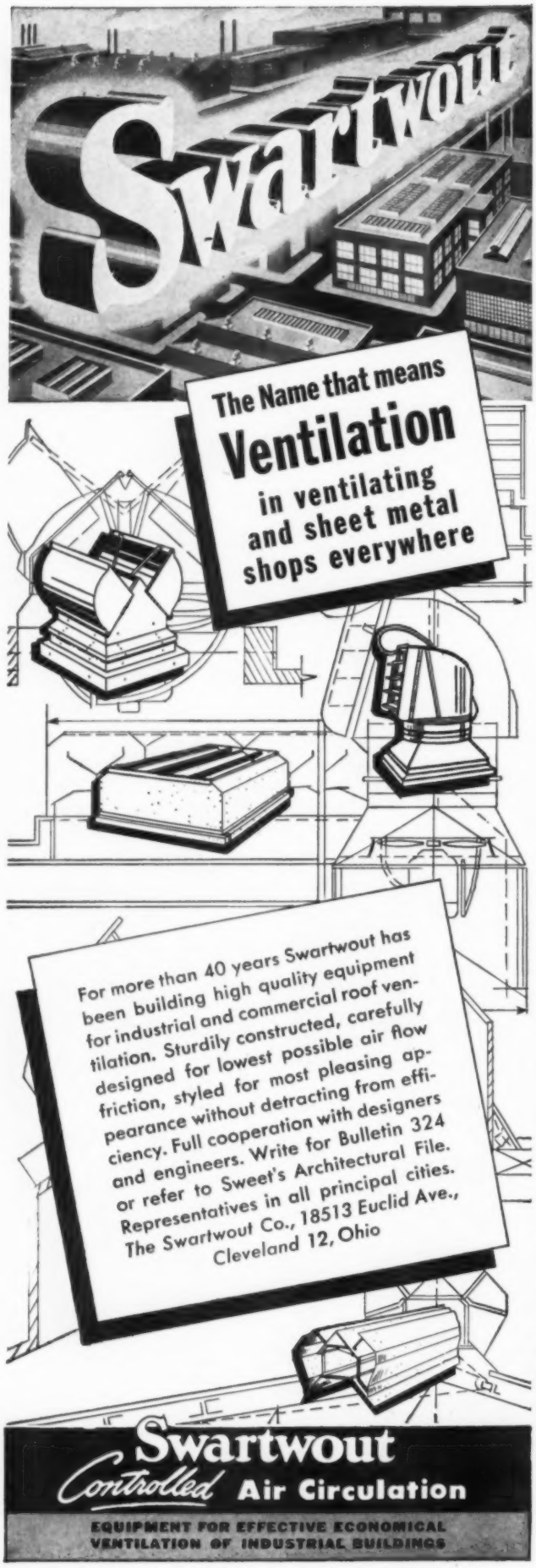
Certified coal fired gravity furnace, round



Certified coal fired Mammoth furnace

The easy conversion of Certified Furnaces from one fuel to another helps solve today's uncertain restricted fuel problem. A Certified Furnace takes care of your customer's comfort now, and later . . permanent satisfaction. Certified Furnaces are right . . . right for immediate use in any locality . . right for tomorrow's changing conditions.

CERTIFIED FURNACE CO.
DIVISION OF STAINLESS & STEEL PRODUCTS COMPANY
1000 BERRY AVE. ST. PAUL 4, MINN.


Swartwout
The Name that means
Ventilation
in ventilating
and sheet metal
shops everywhere
For more than 40 years Swartwout has been building high quality equipment for industrial and commercial roof ventilation. Sturdily constructed, carefully designed for lowest possible air flow friction, styled for most pleasing appearance without detracting from efficiency. Full cooperation with designers and engineers. Write for Bulletin 324 or refer to Sweet's Architectural File. Representatives in all principal cities.
The Swartwout Co., 18513 Euclid Ave., Cleveland 12, Ohio
Swartwout
Controlled Air Circulation
EQUIPMENT FOR EFFECTIVE ECONOMICAL VENTILATION OF INDUSTRIAL BUILDINGS

much as $5.00—or more—on each account, even though no collection has been made.

Although mention is made of the 25 per cent the agency receives on collected accounts, this disarming provision is added: "50 per cent . . . on claims settled through the assistance of Magistrates, Attorneys, or our Legal System or on installment collections." Since almost every debtor pays in installments, or receives a letter from the agency's attorney, the full 50 per cent can be charged in most every instance.

The contract also empowers the agency to reduce the claim at will to "settle" with the debtor. The agency will eventually accept as little as 10 per cent in full settlement for immediate payment, giving the debtor their receipt in full in their capacity of "assignees". The agency has nothing to lose, since it keeps all the money anyhow.

An interesting sidelight of this type of agency is that, every year or so, they will change their name and send a new crew of salesmen to solicit accounts from the same merchant. And they will commiserate him on the "gypping" he got from the "other" agency. Their own agency, they assure the merchant, is *different* . . .

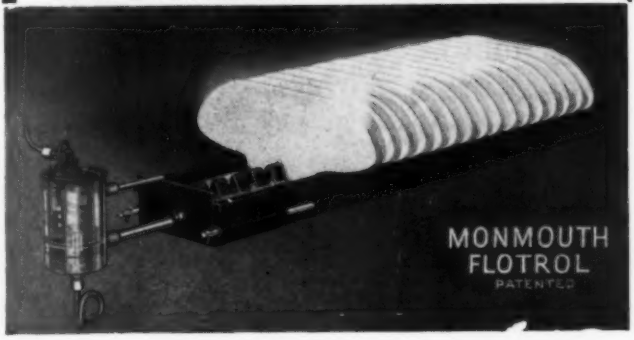
This article is not intended to condemn all collection and adjustment firms—it describes one type only. There are many, many collection agencies which render a valuable and efficient service to both merchants and professional men. In most cases, however, the reliable firms do not attempt to gobble in more territory than they can handle by personal call.

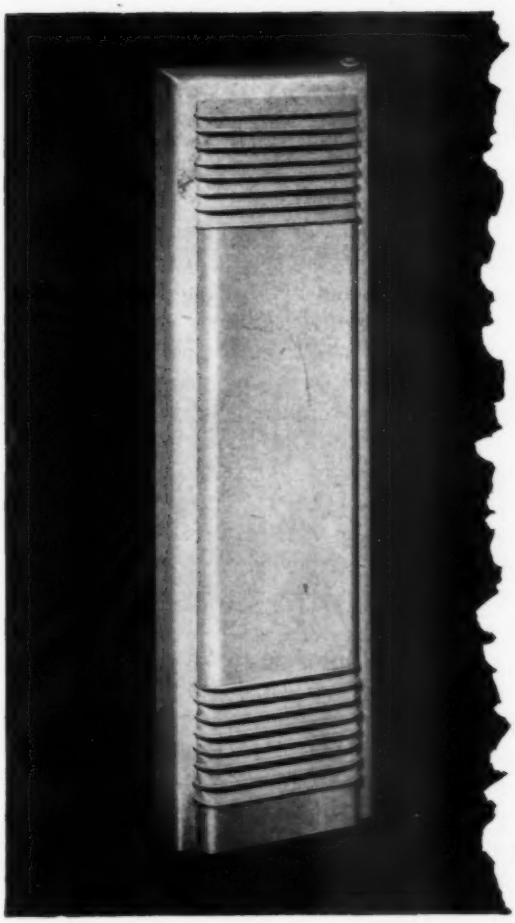
MONMOUTH HUMIDIFIERS

• For healthful heating, use a good humidifier on every heating installation you make. For long dependable performance, and freedom from repairs and adjustments, make it a Monmouth FLOTROL, or a MICRO-FEED, the best engineered and built humidifiers available. Get that easy EXTRA profit in every Monmouth sale. We also make gas operated HUMIDITY CONDITIONERS for all radiator jobs.

Bulletin and prices on request.

7802 Wade Park Ave., Cleveland 3, Ohio
THE CLEVELAND HUMIDIFIER CO.





it's WARM-MAGIC

Gas-fired 20,000 BTU vented Wall Warmolator for homes, offices, motels, apartments, etc. Fits between 2x4 studs on 16-inch centers without furring or special framing. Unusual standard features include 3-way heat control, 100% safety pilot. Approved for all gases.

FOR REMODELING JOBS TOO!

It's easy to install the handsome new Warmolator 20 in older houses. Write for complete information and plan sheets telling how to do it.

WILLIAMS RADIATOR CO.
1821 Flower St., Glendale 1, Calif.

Warmolator

Only $2.00 for This Outstanding Book on Air Conditioning

THIRD EDITION

Air Conditioning for Comfort

By Samuel R. Lewis

288 Pages—6½ x 9½—Cloth Bound

Easy to understand . . . accurate . . . comprehensive . . . these are the features of this third edition of Samuel R. Lewis' well-known AIR CONDITIONING FOR COMFORT. Fundamentals are fully and clearly covered. Correct procedure in designing complete systems for both residences and large buildings is explained step by step. In addition, considerable original data on such subjects as standards, noise control, measurements, and fire protection codes has been included.

Send $2.00 for a copy today to the address below. We know you will consider this one of the finest air conditioning books you have yet seen, but if you should be dissatisfied with it for any reason whatever, your money will be promptly returned to you.

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Western ROTARY TURBINE VENTILATION

- **SMOOTH**-working ball bearings—guaranteed for the life of the ventilator.
- **TURNS** with the gentlest breeze—gives low cost efficient ventilation.
- **REQUIRES** no power—no attention—no lubrication. Sturdy precision construction for a lifetime of trouble-free service.

Western Rotary Turbine Ventilators are available in all sizes for industrial, commercial and institutional jobs. Write for complete catalog and engineering data.

"Always on the job—never on the payroll"

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Speed Up Orders With a

BEVERLY SHEAR

Throatless shears that cut any shape . . . straight, circular or irregular. FASTER — accuracy! Order No. 1 for 14 gauge. No. 2 for 10 gauge. No. 3 for 3/16 inch mild steel and 10 gauge stainless. Available with or without stand.

BEVERLY SHEAR MFG. CO.
3001 W. 110th Place Chicago 43, Ill.

Surewarm Homes Solution

(From page 92)

ANSWER: The overheating of the second level rooms was actually due to the fact that the stairway to the second level was in the center of the room. The two warm air leads at the outer end of the room forced warm air out and across the ceiling toward the south wall, which under normal conditions, from the momentum and syphoning effect gained, would be forced down the south or outer wall and back across the floor toward the return. However, this pressure could be relieved more easily by warm air sliding up the stairwell and this is the path it took. Thus, all of the warm air pumped into the living room went across the south wall, and both of the streams turned back toward the center and up the stairway with almost the velocity it had when leaving the register.

To all effects, I was pumping no heat into the living room, and all of the heat that should have gone into the living room I was pumping into the second floor. The only way to stop this was to install a warm air register in the second floor hall. This was put in at a level which would allow me to direct air and build up a counter pressure at the entrance to the stairwell thus counteracting the tendency of the warm air to go up the stairwell. This pressure also forced the two living room warm air leads to perform their proper function of supplying the air across the ceiling and down the

C. S. E. Draft-Korektors in Complete Range of Sizes . . . . . .

For Every Type of Installation

Cole-Sewell's Draft KoreKtor No. 907 (shown right) with the completely new finger-tip adjustment achieves a greater sensitivity to the lightest air movement. It has the same close fitting blade swinging on knife-edge pivots which has proven so trouble-free and efficient in thousands of installations. The full size unrestricted opening provides better control to strong drafts. Each control is factory balanced and ready for quick installation. Built in sizes to fit standard domestic pipe from 7" thru 12".

No. 907

Now—get set with the Cole-Sewell No. 904 Draft KoreKtor (shown right) in the 4, 5, and 6-inch sizes. You get the same top standard of quality performance backed by our years of experience in building better draft controls. The new simplified adjustment provides constant control of drafts to attain fuel economy without loss of heating comfort. The close fitting blade swinging on knife-edge pivots maintains delicate balance so necessary for efficient fuel combustion. Furnished in all sizes with or without tee.

No. 904

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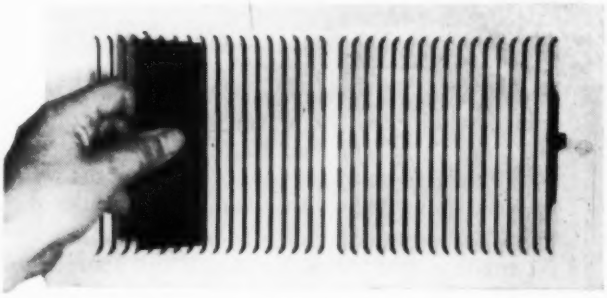
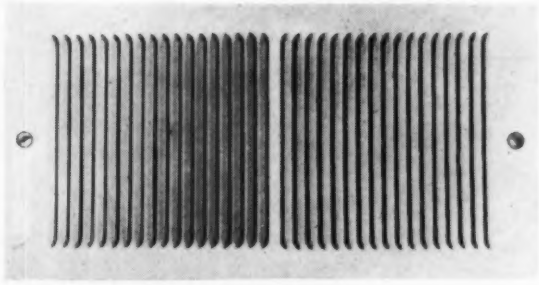
TRADE MARK

TEN DAY DELIVERY FOR STANDARD SIZES
(UNDER 100 PIECES)

DESIGNED FOR RESIDENTIAL AIR CONDITIONING



STYLE 8TM—SELECTIVE UP - STRAIGHT - DOWN DEFLECTION FROM SHUTTER. RIGHT AND LEFT DEFLECTION FROM FACE.



STYLE 8 GRILLES TO MATCH STYLE 8TM REGISTERS.

Write today for your copy of our complete catalog

REGISTER & GRILLE MFG. CO., Inc.

66 BERRY STREET BROOKLYN 11, N. Y.

You'll Sell Your Customers More When You

Sell Them Clipper

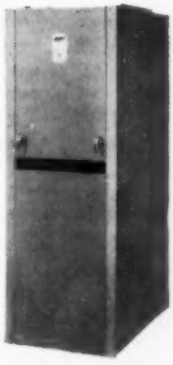
Here is a typical Clipper air-conditioning furnace with front panels removed to show easy accessibility of controls, blower and burner equipment.

Not only do Clipper automatic gas-fired furnaces with the Multi-Stream Heat Exchanger offer efficient economical heating, but also modern air conditioning for the greatest living comfort.

COMPLETE RANGE OF SIZES. Clipper furnaces are built in a range of sizes from 80,000 to 200,000 BTU.

COMPETITIVE PRICES. Despite their fine engineering, heavy gauge metals, highly improved controls and other features, Clipper gas-fired furnaces are priced in competition with ordinary furnaces.

IMMEDIATE SHIPMENT. Due to the size of the Henderson plant, equipped with the most modern machinery and to the fact that the plant is located in one of California's most productive climates where steady home-owning mechanics are available, we are able to give you immediate shipment of any model.



Compact, with baked enamel finish, the Clipper is attractive for installation anywhere. Clipper units are easily installed even in a small closet. *All Clipper furnaces, regardless of size, are shipped to you completely assembled, completely wired and individually tested at the factory.*

You'll Find the Clipper Enables You to Sell More—For complete information on Clipper gas-fired units and also on the details of a profitable sales representation plan, fill out and mail this coupon.

HENDERSON FURNACE AND MFG. CO.

SEBASTOPOL, CALIFORNIA

Henderson Furnace and Manufacturing Co.
Sebastopol, California

I am interested in the sales opportunities of Clipper furnaces. Please send me complete information.

*Name*_____

*Address*_____

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last year... in a single 30-day test—

3,300 people wrote, "WHERE CAN WE FIND IT?"

8 out of 10 BOUGHT

the new FRESH'ND-AIRE

ROOM CONDITIONER AND HUMIDIFIER . . . $59.50

1. Moisturizes the air correctly.
2. Cleans, washes air; filters out dirt, dust, smoke, pollen.
3. Provides greater comfort at lower room temperatures. Cuts heating costs.
4. Circulates air—without drafts.
5. Simple, sturdy, trouble-free. No servicing headaches!

and this season will be even bigger

Last year, the first national ads appeared—and then WHAM!—thousands of customers wanted the protection for health-and-home furnishings offered by Fresh'nd-Aire Room Conditioner and Humidifier.

In one month, 3,300 people who could not locate Fresh'nd-Aire Humidifiers at their dealers—wrote Fresh'nd-Aire direct. More than 80% of these inquiries resulted in sales.

Don't "miss the boat" this season. Powerful advertising in *The Saturday Evening Post* and *House & Garden* will bring customers to you *this year!*

Mail Coupon NOW!

FRESH'ND-AIRE COMPANY
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Export Sales: The A. J. Alsdorf Corp., Chicago 1, Ill.

FRESH'ND-AIRE COMPANY
Dept. AA-108 221 N. LaSalle St., Chicago 1, Ill.

Please rush full details of new Fresh'nd-Aire Room Conditioner.

☐ Have representative call ☐ Just mail information

☐ Send complete advertising package

Name .....

Address .....

City ..... Zone ..... State .....

outside wall and back across the floor, making two individuals very happy—your hero, the great Surewarm Homes, and the lovely lady. This episode made me conscious of the necessity of analyzing the airflow in placing the high side wall registers, or for that matter, any registers. I have found that if you can direct the air toward an opposite corner, the walls converging at this corner force the warm air down and back across the floor. Then there is no possibility of the thing occurring which happened in this case, and crime will be prevented.

Ruttenberg

(From page 84)

come and there is money to keep this inflation boom going. When you look at the whole budget for $42 to $44 billion you will find that $24 billion of it is for nonproductive or nonconsumptive purposes, with ERP material going abroad that cannot be consumed in this country.

I made a few comments about the sources of purchasing power because that is the key as long as the situation remains the way it is and steel is short. Just as soon as purchasing power dries up, as it will somewhere down the line, there will be a surplus of oil and steel and everything except jobs. Meanwhile, this is a great day to be in the oil business and I guess a great day to be in the industry making steel products; but unless we increase our basic metal producing capacity, you consumers and distributers are out in the cold.

AIR-FLO
AUTOMATIC
CEILING SHUTTER
FOR ATTIC FAN
Built so they can be installed practically flush with the ceiling, AIR-FLO Ceiling Shutters present a refined, finished appearance. Their natural aluminum color blends with any decoration, eliminating need for painting, and no grille or winter cover is required. Furnished in 5 different widths, single panel up to 73" long. No operating mechanism shown. Built-in fusible link. Meets fire underwriters requirements.
WRITE FOR NEW CATALOG 43-C
Illustrations and details of the complete AIR-FLO line.
AIR CONDITIONING PRODUCTS CO.
2340 W. LAFAYETTE BLVD. • DETROIT 16, MICH.

Thru Bonus Buying

You make more money!

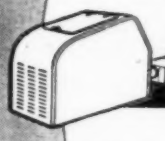
In 3 ways it makes sense to buy all your heating equipment from ANCHOR.

First, you'll earn quantity discounts. That's more money for you.

Second, you'll save time and trouble by dealing with one source for all heating equipment.

Third, you'll make sales easier, quicker . . when you offer your prospects a selection of every type of dependable equipment under one name . . Anchor.

Write today for complete facts and descriptive literature. Anchor Division, Stratton & Terstegge Co. Inc., P. O. Box 311, New Albany, Ind.



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Domestic . . . Commercial . . . Industrial Models for every building requirement.

ANCHOR AIRE

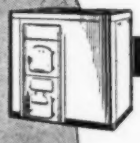
OIL FIRED FURNACE

With Automatic Winter Air Conditioner.

ANCHOR AIRE

GAS FIRED FURNACE

With Full Automatic Controls



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COAL FIRED FURNACE

Round and square cased types . . . from small home-heating sizes to heavy duty models for industrial plants.

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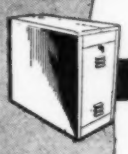
OIL BURNER

Fully Automatic . . .
The Ideal Conversion Unit.



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DOMESTIC BOILERS

For Hot Water or Steam Tanks or Tankless.

Also manufacturers of
ROUND OAK Gas & Electric Ranges

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America's Finest Automatic Heating Equipment

FREE!

SEND FOR THIS LITERATURE ABOUT

THE NEW CHASE

THRU-WALL *Copper* FLASHING

(3-Way Bond!)

YOU'LL want to know about the unique saw-tooth corrugations that bind the masonry both laterally and vertically in every direction—a 3-way bond flashing that's priced economically!

Remember, too:

1 When you install Chase *Thru-Wall* Copper Flashing, you offer the best buy—pay no more.

2 Easily bent by sheet metal contractor.

3 Available through 22 Chase warehouses and through distributors.

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Mail coupon today to Dept. AA108!

Please send free descriptive literature about Chase *Thru-Wall* Copper Flashing.

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Waterbury 91, Connecticut

SUBSIDIARY OF KENNECOTT COPPER CORPORATION

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8 out of 10 BOUGHT

the new

FRESH'ND-AIRE

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1. Moisturizes the air correctly.
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☐ Have representative call ☐ Just mail information
☐ Send complete advertising package

Name

Address

City Zone State

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ANTHRACITE AND BITUMINOUS STOKERS

Domestic . . . Commercial . . . Industrial Models for every building requirement.

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OIL FIRED FURNACE

With Automatic Winter Air Conditioner.

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Round and square cased types . . . from small home-heating sizes to heavy duty models for industrial plants.

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DOMESTIC BOILERS

For Hot Water or Steam Tanks or Tankless.

Also manufacturers of
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Chase

BRASS & COPPER CO.

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Waterbury 91, Connecticut

SUBSIDIARY OF KENNECOTT COPPER CORPORATION

This is the Chase Network—handiest way to buy brass

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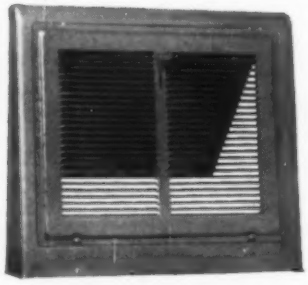
NEW STANDFORATED PERFORATION OF ALL METALS GRAVITY BASEBOARD REGISTERS

NOW IN PRODUCTION

QUICK DELIVERY!

2-Piece Construction with Removable Face of "BEND-EZY" Design. Metallic Finish.



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Immediate Delivery on All Standard Sizes

SPECIFICATIONS:

Duct Size	Base Ext.
10" x 8"	2½"
12" x 8"	2¼"
12" x 9"	3¼"

PERFORATED METALS FOR EVERY INDUSTRIAL USE

We also manufacture the MIRRO-GLO LINE of Bathroom Medicine Cabinets.

WRITE FOR COMPLETE INFORMATION, PRICE LIST.

STANDARD STAMPING & PERFORATING CO.
3137 W. 49th PLACE • CHICAGO, ILLINOIS

Neubecker Air Conditioning Fittings

(From page 89)

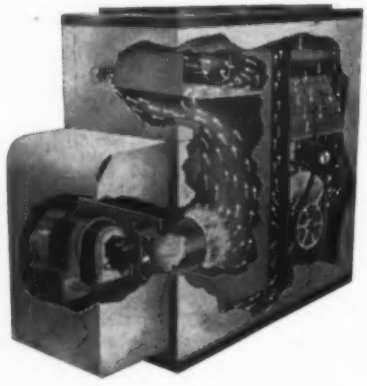
C°-C°, making C°-1°, B°-14°, A°-2° and b°-a° equal respectively to similar lettered perpendiculars shown in elevation. Now draw lines in the pattern from 1° to 2° and 14° to x°. Now with B° and A° as centers describe the arcs x°-b° and 2°-a° respectively. This gives the net pattern shape for the inner angle sides at a 90 deg angle, when a right angle bend is made on the solid line a°-b°.

Pattern for Both Throats

For the pattern for the throat of the branches take the girth or stretchout of the throat shown in elevation from 9 to 14 as indicated at the top of the full page drawing making its width equal to 12 in. as shown in plan.

Method of Assembling the Fittings

In assembling the two arms or branches, the Pittsburgh lock can be used; allowing a single edge on the outer and inner sides of the arms and a double lock on the two sides of the throat pattern and on the straight sides of the heel pattern. The locks are shown in diagrams R and S. Along the outer angular miter joint between the two heels, a lapped, riveted or soldered lapped joint can be used.



HACKER
STANDARD HEATING EQUIPMENT CO.
WATERLOO, IOWA

GREATER DEALER PROFITS!

★ LOWER COST TO YOU . . . production line assembly.

★ PACKAGED UNIT . . . no set up required.

★ EASILY SERVICED . . . all standard parts used.

Can be delivered to average basement completely assembled. Where necessary canopy and burner can be removed in a matter of minutes reducing length to 4 feet.
HEAVY STEEL BOTTOM eliminates cementing.

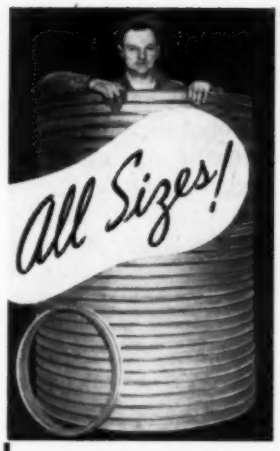
SHIPPED COMPLETE WITH: Gun Type Oil Burner (Underwriters approved). 12" Blower (with motor). Stainless Steel Comb. Chamber. Standard Size Filter. Automatic Drip Humidifier. Automatic Draft Regulator. Thermostat, Stack Switch. Comb. Fan & Limit Control.

SPECIFICATIONS:

Length overall	62 in	Height	52 in
Width	24 in	BTU Cap. (at bonnet)	100,000
		Shipping Weight	525 lbs.

Some sale territories open — Write for descriptive literature and prices.

Manufactured by
STANDARD HEATING EQUIPMENT CO.
Waterloo, Iowa



ANGLE RINGS

to

Specifications

Angle Rings are rolled in our plant every day by experienced, skilled workmen who have the knack of accurately turning out rings with uniform curvature. We can supply complete circles or any part thereof. They can be furnished with or without bolt and rivet holes.

Tees, Bars, Channels and special shapes can also be rolled in the same expert manner to your specifications.

Angle Rings are used for many purposes such as reinforcing tanks, joining pipe or smoke stacks, and installing air conditioning fans. Write for our list of standard sizes and discounts—also our new circular just off the press.

NATIONAL METAL FABRICATORS
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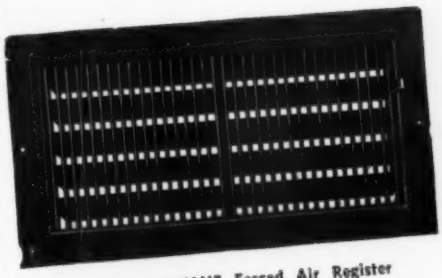
AIR-VANE FORCED AIR REGISTERS



No. 802 AIR-VANE Forced Air Register

Made By ROCK ISLAND . . . You Know They're Good!

Quality of equipment is essential to the performance and life of any modern forced warm air heating installation. You'll find that Rock Island's AIR-VANE Line will fill the bill for you on the most exacting jobs. They're constructed with vertical or horizontal vanes for right or left or downward deflection of air flow. Multi louvre dampers for closing and 15 degrees downward directional air flow are standard. This versatile model is also available with single louvre in wall or baseboard registers.

Check the complete Rock Island line . . . if it's a Rock Island Register you KNOW it's good.

ROCK ISLAND REGISTER CO.

ROCK ISLAND, ILL.

2435 FIFTH AVENUE

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PUNCHES

Rotex 18 is ideal for any shop fabricating sheet material. Changes instantly...17 sizes from 5/32" to 2", with 2" nibbling shear. Clean, fast, accurate...10-18 gauge capacity. Used by small and large shops—Fisher Body, General Electric, Lockheed, Douglas, many railroads. First cost is lower, yet the Rotex does more work faster, better.

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4726 EAST 12 STREET • OAKLAND 1, CALIFORNIA

WHITNEY-JENSEN PRODUCTS

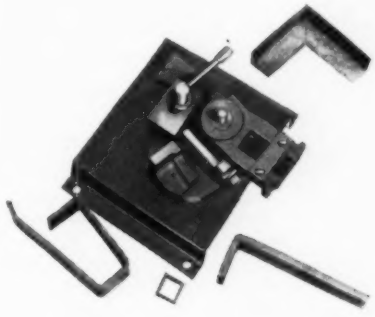
38 YEARS EXPERIENCE

NO. 50 ANGLE IRON MITRE NOTCHER

Capacity

All sizes of angle iron through 2" x 2" x ¼".

Weight—62 lbs.



NO. 53 UNIVERSAL BENDER

Capacity

2½" x 2½" x 3/8" Angles

2" x ½" Flats

Weight—77 lbs.

Write for Catalog 16-48

WHITNEY METAL TOOL COMPANY
91 FORBES ST. • ROCKFORD, ILL.

BIG profits for you

WITH *Cozy* GAS FLOOR FURNACES

Dealers all over the country are realizing an increasing demand for Cozy Floor Furnaces. Twenty years of successful performance are paying off. You should be getting your share! And you can get it!

MODELS AVAILABLE FOR ALL TYPES OF GAS FUEL INCLUDING L-P GASES

SELL THESE 9 FEATURES

1. Grille — unbreakable steel. 84% open area means greater efficiency in air circulation. Finish harmonizes with home interiors. Grille is easily removed.

2. Peep Hole Cap — Furnace operation is easy to visually check through Pyrex Glass.

3. Removable Inner Jacket — Air insulated inner wall, separating warm and cool air chambers, insures maximum heat recovery and circulation — outer air passageway cannot become heated.

4. Valves — Single rod control simplified operation. Control is conveniently located.

5. Pressure Regulator — Prevents gas pressure fluctuations and conserves fuel consumption.

6. Outer Housing — Heavily constructed and exceptionally rigid for long life.

7. Chimney Draft Diverter — Constant normal draw conserves heat and prevents blowing out.

8. Heating Unit — Improved design heat transfer unit assures complete combustion and greater radiation surface — gives greater heat recovery.

9. Burner — Ribbon type burner gives quiet operation. Cast-iron jets for long life. Cannot get out of adjustment. Stainless steel removable burner head and orifice — no corrosion — constant full heating capacity. Standard equipment is Baso Safety Pilot with 100% shutoff in case of flame failure from any cause.

Territories Available
Write or Wire for Details

ADVANCE FURNACE COMPANY
2300 EAST DOUGLAS, WICHITA, KANSAS

Refractory Fire Boxes

(From page 91)

enough to extend under front, back, and side walls of the firebox. Make the floor at least 2½ in. thick.

4. Build the back, side and front walls, leaving an opening in the front wall for the gun tube. For small and medium-size fireboxes, walls 2½ in. thick work out well, if they are backed-up with lightweight insulating concrete. Where space in the ashpit permits, however, the walls may be made 4½ in. thick, as this permits building durable over-hanging corbels on the front and back walls, and forms an exceptionally sturdy, long-lived combustion chamber.
5. After the walls have been built, use insulating concrete mix to fill completely all the spaces around the firebox, to the height of the top of the side walls. Around the gun tube of the burner, fill in with pieces of insulating firebrick held in place by mortar or insulating concrete mix.

   Sidewall heights are listed in the tables above. To make lower side walls invites poor combustion. Make them 2 to 4 in. higher if convenient.
6. Fill the firing or flame inspection door with insulating concrete mix to obtain quietness and clean burning.
7. Start the burner as soon as the installation is completed—run it for not more than fifteen minutes, then keep it idle for five minutes or so to permit the firebox to cool. It is advisable to repeat this operation several times, with burner on for

PERFORMANCE PLUS!

ATH-A-NOR
Furnaces and Parts

* * *

Performance is the yardstick for measuring the efficiency of any heating plant, and those that will operate year after year with little or no attention are the ones which will return you the most profit.

You're sure of top drawer performance when you install ATH-A-NOR Furnaces and parts exclusively. Over fifty years of furnace manufacturing experience guarantee you home heating plants with performance ratings and lasting qualities to satisfy the most critical clients. Investigate now . . . write for literature.

MAY-FIEBEGER COMPANY

Manufacturers of Quality Heating Equipment for Over Fifty Years.

Newark **Ohio**

IN THE CRISE YOU GET THE COMPLETE PACKAGE

including
LIMIT SWITCH
and
SPRING RETURN

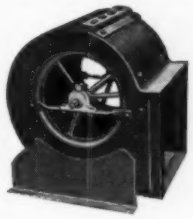
T-80 Thermostat
Sensitive two wire low voltage thermostat—suitable for operating gas valves, relays, motors, etc.

HIGHEST QUALITY—PRICED RIGHT

No matter what you pay you can't buy a better heat control than a Crise. And consider, too, that Crise includes a *limit switch* and *spring return* that are usually sold as extras. Just demonstrate this step-saving, coal-saving, labor-saving control to people with hand-fired heating plants. It sells on sight and you'll make a nice profit from every installation. Over 750,000 are in use. *Write now for the name of your nearest jobber.*

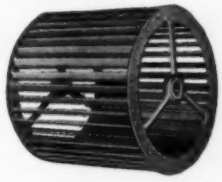
CRISE Electrical HEAT CONTROL
CRISE MANUFACTURING CO., COLUMBUS 16, OHIO

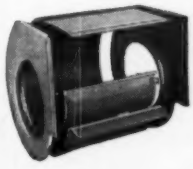
• BLOWERS •
for
Air Conditioning Furnace Manufacturers



The *New* Bishop & Babcock Air Conditioning Blower Assembly Type "AC"—Design 2

The *New* Bishop & Babcock Blower Wheel For Air Conditioning Furnace Blowers





The *New* Bishop & Babcock All Stamped Housing Assembly and Component Parts

Write for Bulletin No. 115

MASSACHUSETTS BLOWER DIVISION
The BISHOP & BABCOCK Mfg. Co.
4901 HAMILTON AVENUE · CLEVELAND 14, OHIO

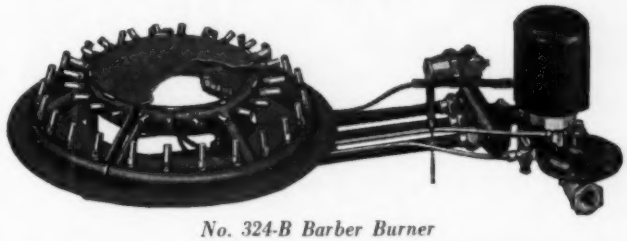
SERVICE *is our story!*

Northwestern service always means the finest, fastest, most reliable way to get parts for furnace repair jobs. You'll find our trained staff will extend themselves to the utmost to help you out of tight corners whether your order is large or small. We've built up our reputation for that kind of service during many, many years of pleasant association with dealers and contractors all over the country. They know what we mean when we say that "Service is our story."

We'll be glad to prove it to *you* if you haven't as yet tried us. Please write today.

NORTHWESTERN STOVE REPAIR COMPANY
662 West Roosevelt Road, Chicago, Illinois

BARBER BURNERS
For Better Conversion Jobs—



No. 324-B Barber Burner

Barber gas conversion burners automatically or manually controlled, are tailor-made in proper sizes and capacities to fit the heating requirements of all types and sizes of round or oblong furnaces and boilers. They operate with maximum economy and efficiency, both from the heating equipment and the gas fuel, no matter what type. Barber design is widely preferred for its superiority over many competitive, *experimental* burners, because of its basically better combustion principle. If the owner already has automatic controls, these usually can be used with a Barber installation. The burner is the *heart* of the appliance. See that *your* conversion jobs are equipped with genuine Barber burners.

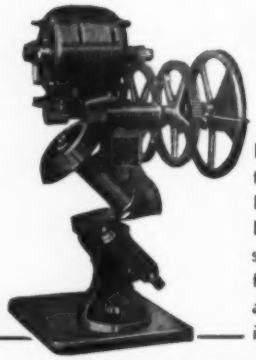
Listed in A.G.A. Directory of Approved Appliances.
Ask for catalog and prices on conversion burners, appliance burners, and pressure regulators.

THE BARBER GAS BURNER CO.
3704 Superior Avenue · Cleveland 14, Ohio

BARBER *Automatic* JET GAS BURNERS
for Furnaces, Boilers and Appliances

The Most Profitable Tool in the Shop!

MARSHALLTOWN



THROATLESS SHEARS

Regardless of your cutting job the MARSHALLTOWN Throatless Shear does it QUICKER, EASIER and BETTER! Irregular shapes or straight splitting—from ANY width sheet. Available in hand-operated or motorized models!

CUTS ANY SHAPE OR SIZE
CAPACITY UP TO ¼" STOCK
CUTTING SPEED 6' PER MINUTE
PROMPT SHIPMENT

Send Today for Special Information Bulletin

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CUT YOUR BUILDING COSTS.. AND STILL DO A BETTER JOB WITH CHINC

That Amazing New Metal

FOR FLASHING
1. VALLEYS
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3. WINDOW FRAMES
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6. GUTTERS-DOWNSPOUTS
7. TERMITE SHIELDS

HIGH grade zinc, copper and magnesium are combined to produce a tough, strong, workable sheet metal at less than half the cost of 16 oz. copper.
Can't rust, solders easily, forms readily, doesn't stain white trim, doesn't corrode in mortar joints, and stands up at the seashore where so many metals meet their doom.
Made in rolls, strips, sheets and a full line of rain carrying equipment, including gutters and downspouts, all 26 U. S. gauge.
Meets government requirements for housing.
Sold by distributors everywhere. Send for literature and sample.
Another CHENEY Product

THE ALLAN CORP.
623 Prospect Street
Trenton 8, New Jersey

fifteen minutes and off for five minutes. Also, at first open the air damper on the burner sufficiently to obtain a cool, white flame. Set it later for an efficient, hot, reddish flame.

Special Features

Higher Side Walls: Low side walls should be avoided, especially with oils that require somewhat higher temperatures for complete combustion. Side walls 12 in. high are too low. For peak efficiency using *any* oils, make the side walls at least as high as indicated by the firebox dimension tables in this article. Where incomplete combustion or low CO_2 are resulting from the use of lower side walls, efficiency can be improved by the use of higher side walls even though the higher walls may cover some of the direct heating surface of the furnace or boiler. Published data show that in one set of thorough firebox tests side walls 19 in. high gave higher efficiencies than side walls 13 in. high, and side walls 24 in. high gave still higher efficiencies. Stack temperatures did not increase as side wall height was increased up to 24 in.

Corbels: Corbels, or stepped-in walls, are decidedly advantageous where exceptionally high CO_2 readings and soot-free combustion are desired from burners with only ordinary air-handling parts at the ends of the gun tubes. Where the equipment dealer has a choice, he should, of course, install only a modern burner which has excellent air-handling parts at the end of the gun tube. By taking proper care in building the firebox (making the side walls especially high, providing pronounced corbels for both the front and the rear walls and using the correct materials) a dealer

AJAX

FURNACE PIPE & FITTINGS

FOR FORCED AIR AND AIR CONDITIONING INSTALLATIONS

- The quality of "AJAX" Fittings is fully guaranteed.
- Made of high-grade full gauge sheets. No seconds used.

Every order, large or small, receives personal attention.

AJAX FURNACE FITTING CO.

Division of
THE CINCINNATI SHEET METAL & ROOFING CO.
216-20 E. Front St., Cincinnati, Ohio

TYPE JMI MERCOID SAFETY AND IGNITION CONTROL

"A"—Special high temperature bimetal assures constant sensitivity and long life.

"B"—The differential adjustments permit adjusting in the field to meet variations and fluctuations in stack temperatures.

"C"—Only three mercury switches used for motor, safety and ignition.

"D"—The safety timing mechanism determines the time the burner can operate without flame. It is set at the factory, but may be changed when necessary. In case of a safety shut-down, turn hand reset button to resume operation.

"E"—The Mercoid Transformer-Relay eliminates all noise and residual magnetism. It acts as its own transformer, inducing low voltage current for the thermostat circuit.

"F"—All terminals are plainly marked for correct wiring.

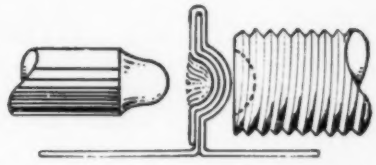
Write for Mercoid Catalog No. 600A

THE MERCOID CORPORATION, 4203 W. BELMONT AVE., CHICAGO 41, ILL.

WHITNEY LEVER PUNCHES

No. 6 Punch

This Tool is especially adapted for Button Punching or for Templet work. Punch will strip where handle cannot be opened to 90 degrees.



These punches are often called Tip Punches, and are used to fasten standing seams without making a hole, by simply indenting the three thicknesses of metal.

W. A. WHITNEY MFG. CO.
636 RACE ST. ROCKFORD, ILL.

DETROIT AIR FILTER

The longer-lasting Filter with Wick-Action

Sold *only* through warm air heating, ventilating and refrigeration trades. Write for illustrated booklet.

DETROIT AIR FILTER CO., INC.
P. O. Box 407 Woodstock, Illinois

add Extra easy Profits with

CIRCULATAIRE

Forced Air Unit for Gravity type warm air Furnaces

- **SAVES FUEL**
- **QUIET**
- **ECONOMICAL**
- **AUTOMATIC**
- **EASILY INSTALLED**
- **AVAILABLE NOW**

PROOF of Dealer Acceptance—During the months of June, July and August over 63% of our business represented Repeat Orders—that is orders placed by dealers who have tried and tested the "CIRCULATAIRE" and recognize the advantages of this unit to home-owner and dealer alike.

Quick Installation—Dealers report making installations in less than 2 hours. "CIRCULATAIRE" requires no change in hot or cold air ducts—nothing for the dealer to furnish except a minimum amount of labor. Quick, easy installation means fast turnover of inventory to profits.

Want Some Quick-Profit Information? Write TODAY—

"CIRCULATAIRE" Division of Corlett-Turner Co., 1001 S. Kostner Ave., Chicago 24, Ill.

SEQUOIA FURNACE

Looks Modern

Compact cabinet is designed and finished for the modern home. Rounded corners. Less floor space. Install in basement, kitchen, or other rooms.

Is Modern

A.G.A.-approved for natural gas, manufactured gas, and liquid-petroleum gas. Approved for low and high altitudes. No traps or baffles. Quiet, automatic, winter air conditioning.

Series "UM"
Gas Fired

Inquire of Your Jobber, Or Write—

SEQUOIA MANUFACTURING COMPANY
1000 Brittan Ave. San Carlos, Calif.

can secure very satisfactory results even from a burner which has air-handling parts not of the most modern design. The use of these corbels, together with the unusually high temperatures of well designed fireboxes, serves to prevent carbon, vapors, or droplets which are not thoroughly burned from escaping from the combustion chamber. If turbulent flame does not fill the front and rear corners of a rectangular firebox, a special flame-fitting design should be used. This point, and the points about high side walls and corbels for front and rear walls, apply especially to gun-type burners firing less than about 1.5 gph. Special designs of fireboxes, are of course not required for small pressure burners that operate well at 10 to 12 per cent CO_2 with standard fireboxes.

Burner Operation: The final important factor in arriving at complete combustion and high CO_2 is to keep the burner running as steadily as is feasible on coldest days, avoiding unnecessary starting and stopping. This may be accomplished by using a sufficiently low firing rate to cause the burner to operate for many hours on a zero day instead of only a few hours; caution is needed, however, not to arrive at under-firing which gives poor heating and may even waste fuel.

To sum up, a correctly designed, rapid-heating firebox of the proper materials, together with proper burner on-off frequency, will insure complete, soot-free combustion. Replacing old fireboxes with fireboxes of insulating firebrick designed in accordance with the principles outlined above, will result in clean, soot-free, economical burning and in many installations will mean an appreciable saving in fuel bills.

ORNAMENTS

STAMPINGS & SPINNINGS

Zinc Ornaments Available From Stock. Copper, brass, bronze, aluminum and stainless steel ornaments made up promptly.

If you don't have catalog K, send for it NOW.

MILLER & DOING
65 YORK STREET BROOKLYN, N. Y.

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CLEAN SWEEP
SOOT REMOVER

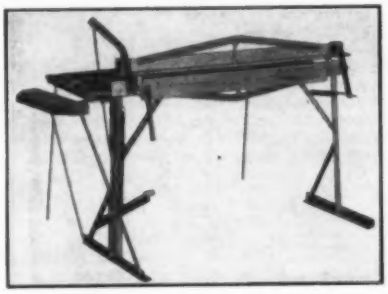
For Profitable Sales & Profitable Service

Clean Sweep thoroughly cleans oil, coal and gas heating equipment while hot, doesn't overheat vital parts—heating plant need not be disassembled. Non-explosive, non-corrosive. Approved by oil burner manufacturers and testing laboratories, it works quickly, leaves no residue, no clogged holes. No special equipment necessary. Now packaged in 6 sizes from small home size to large industrial drums. Ask your Jobber, or write us today.

CLEAN SWEEP CO.
3045 Relfe Road, Lansing, Mich.

HARRIS BRAKES

Portable - Sturdy All-Purpose Brakes



The 4' Brake weighs 175 lbs. Can be ready to transport by removing 4-⅜ nuts in 5 minutes. Folds into a bundle 5"-x 11" x 6' Easily handles 26 ga. Iron. Has Slip Off Feature. 2-Tool Benches. Indispensable if you work on the job.

THE BOBBIE 1 ft. BRAKE Handles 26 ga., is for Small Fast Jobs as Boxes — Outlets, etc., where production and ease of operation are important.

A. R. HARRIS
4548 Hohman Ave., Hammond, Indiana
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Vernois

Use Original Parts

Sooner or later the best of furnaces will need repairs. That's just as true with Vernois Furnaces as any other and you'll save a lot of time and trouble by specifying and installing genuine original Vernois parts. They'll FIT the first time.

MT. VERNON FURNACE & MFG. CO.
MT. VERNON, ILLINOIS

for **HEATING, SHEET METAL and AIR-CONDITIONING JOBS** *You Can't Beat* **TRI-SAW!**

TRI-SAW, without a starting hole, did this entire job quickly, accurately, and economically. It can't be excelled for cutting through any kind of material, including 10-gauge sheet metal. It's fast, safe, efficient, easy to handle!

RCS TOOL SALES CORPORATION
P. O. BOX 1434 JOLIET, ILL.

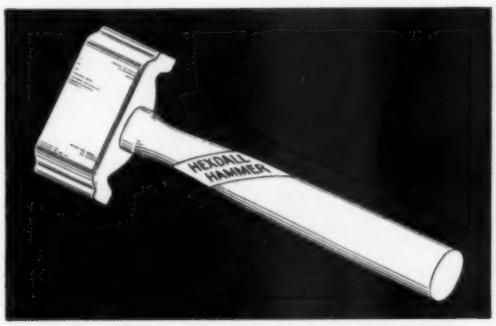
Reinhard's **Air-Lock**
CONVERSION
GAS BURNERS

The Reinhard "Air-Lock" principle causes the flame to spread and reach the sides of the fire-box quickly without the use of baffles, thus ensuring maximum fire travel and heating efficiency.
All valves and controls are under cover—nothing shows in the basement but the neat, attractive casing.

Model 8-CD
LISTED

Quality Products for Over 45 Years
Complete Line of Gas Conversion Burners
Domestic • Industrial • Commercial

REINHARD BROTHERS CO.
11 South Ninth St. Minneapolis 2, Minn.



New! **HEXDALL HAMMER**

(Patent Pending)

Especially designed for use on Pittsburg Locks, this strong, durable hammer will save hours of time, dollars in labor cost. Workers have told us it is the "world's best balanced hammer". Priced at $3.45 — you'd want it if it cost fifty dollars. Order from your jobber, or if your jobber has no supply, order direct from us.

A. M. HEXDALL CO., MORRIS, ILLINOIS
Manufacturers of Sheet Metal Specialties

IT'S NEW! IT'S COMPLETE!

DWYER TRANSPARENT COMBUSTION TEST SET

Correctly Helps You . . .

- Determine proper CO_2 content
- Check for air leaks
- Adjust air controls
- Know draft conditions
- Level burners and controls
- Find stack temperature readings

The new DWYER Combustion Test Set helps you lick the continuing fuel shortage. Every instrument necessary to do the job included . . . CO_2 indicator, Visi-Draft Gage & Level, and Stack Thermometer. Furnished with durable carrying case, all accessories and instructions $33.50

Bulletin 220 describes this set as well as other styles and components. Write for it!

F. W. Dwyer Mfg. Co.
319 South Western Avenue, Chicago 12, Ill.

Mansell—

Surface Preparation

(From page 103)

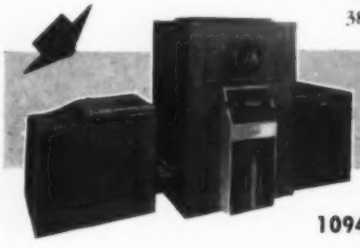
gled surface of the galvanized articles. Further improvement can be achieved by a phosphaging treatment. Another type of zinc coated steel is produced by spraying on a mixture of metallic zinc powder with an organic binder. This is then brought to a high temperature to produce an adherent metal coating; this is discontinuous, however, and therefore not intended for exposure without the application of two coats of paint material.

There are available galvanized sheets which have been treated by the manufacturer with a crystalline phosphate coating. This type of pretreated sheet is ideal for roofing, siding, metal awning, cornices, metal tile, gutter, flushings, downspouts and other building accessories. These have the same forming qualities as the regular galvanized steel, and are not recommended for severe forming and drawing operations. Minor scratches on the surface are not serious but larger scratches have to be patched, using a special paint gripping solution to be applied by brush, wipe or spray.

The process of Bonderizing produces a crystalline phosphate coating which reduces the gloss of the applied finishes. Where this is objectionable and where

EFFICIENT HEAT *without* CLINKER NUISANCE *in the* NEW *Majestic* STOKER FURNACE

This smartly designed, rugged unit is tops in home-heating service, convenience, and economy. Special crown radial fins boost heat output. Inner can permits clean, easy clinker disposal. Any domestic stoker fits either side. It's a Majestic climax to 38 years' experience in heating.



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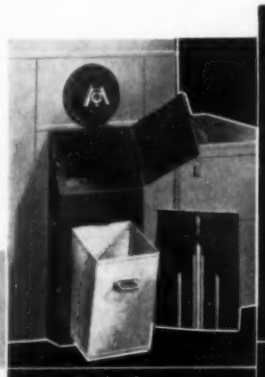

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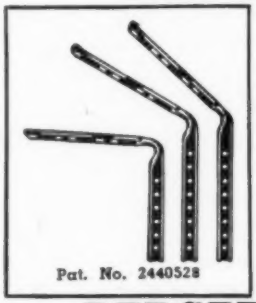

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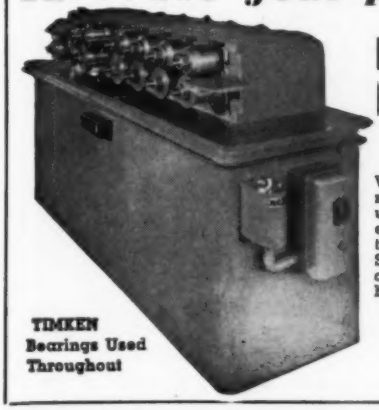

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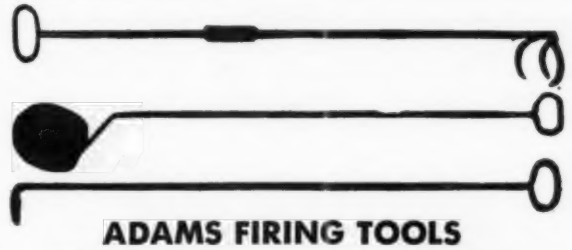

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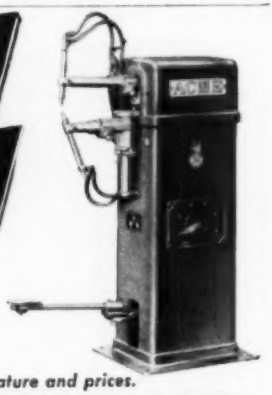
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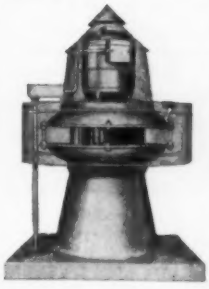

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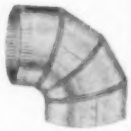

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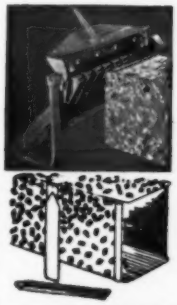

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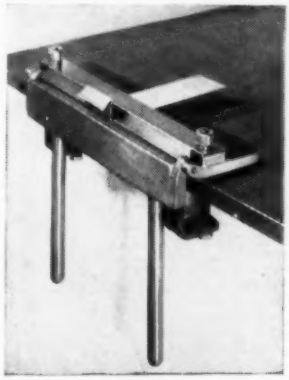

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